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# Digital Justice: Progress Toward Digital Inclusion in Minnesota

Institute on Metropolitan Opportunity  
*University of Minnesota Law School*

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**institute on race & poverty**

Research, Education and Advocacy

# **DIGITAL JUSTICE**

## **Progress towards Digital Inclusion in Minnesota**



*Guadalupe Alternative Programs, St. Paul*



*Sabathani Life Skills, Minneapolis*



*Inver Glen Library,  
Inver Grove Heights*



*PPL Learning Center, Minneapolis*



*PPL Learning Center,  
Minneapolis*

# **DIGITAL JUSTICE**

## **Progress towards Digital Inclusion in Minnesota**

**Institute on Race & Poverty  
December 2006**

**A Report Prepared by the Institute on Race & Poverty  
with support from The MSNet Fund of The Minneapolis Foundation**

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## FOREWORD

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It has been my privilege over the last 16 years to be at the forefront of just about every attempt by Minnesota's public, private and non-profit sectors to build for Minnesotans and our communities an open, inclusive system of information and communications technology (ICT) through which we can advance our collective and individual development.

In 1991, I was working at the Minnesota Department of Administration at the start of STARS, the Statewide Telecommunications Access Routing System, to help government agencies aggregate their telecommunications purchasing. I was among the team members for Access Minnesota in the mid-1990s to bring 56 kb lines into every county to begin using the Internet.

Well before that, people I consider my mentors started the grassroots organizations that coalesced public, private and non-profit interests in building a democratic use of ICT to better our lives. Organizations such as the Telecommunications Information Policy Roundtable met nearly every week during the legislative sessions in the late 1980s to mid-1990s when Minnesota made visionary investments in technology for schools and libraries.

In 1996, I was one of 10 people to help start the fledgling Minnesota Office of Technology, a bold experiment to accelerate Minnesota's opportunities to use the telecom revolution to improve our lives and livelihoods. It failed — probably because we pushed too hard, too fast (though if OT had succeeded, Minnesota would be light-years ahead of where it is now, leading every state in the country). We were on the cusp of electronic commerce with partners ranging from rural Minnesota (starting the E-Commerce Ready Community program) to the United Nations. After that experience, I was working for Minnesota Regional Network when it was sold to Minnesota Equal Access Network (now Onvoy), the proceeds of which formed the Minnesota State Network Fund of The Minneapolis Foundation which funded this study and other projects since its inception in 1998.

We didn't know it then, in 1998, but we know it now: The non-profit sector had to pick up the slack of leadership in the ICT arena, given all the squabbles and resulting policy paralysis on the part of government and the private sector. As soon as there was money to be made in the Internet, the collaborative spirit to build a just, inclusive system in Minnesota dissipated. (The change began in 1995-1996 when the Internet went commercial and the Telecom Act of 1996 superseded the 1934 Act.)

Suddenly the quaint notion of communications access and literacy as essential to a healthy democracy vanished as market worship took over. We lost the courage to create laws like our forebears had when they wrote the Universal Service rules for the Telecom Act of 1934 — the one that guaranteed we would look out for each other no matter where

we lived, because it was essential to have a stable, reliable, affordable communications system for national security and for national development.

This report outlines where many of the continuing gaps remain. We can do better. We must do better — in sharing resources to improve infrastructure investments and in education for technical and information literacy so that EVERYONE can read and write and know how to use the digital tools of our age to communicate, work and learn.

We continue to build into governance, business, education, and health care systems that force people to access resources digitally. It's convenient for many, but those who don't have access, can't afford access or don't have the know-how to participate are cut out of the system and fall further behind.

Other states and countries race ahead of us to ensure that their ICT systems are ubiquitous and that their citizens are informed and participating. To ignore the digital injustices here at home is to imperil our economic and societal future.

When the MSNet Fund was created, its resources were committed to benefit all Minnesotans, on the premise that the Information Age holds great promise to enfranchise people who are cut off from opportunities for economic or educational advancement. We believed then, and we still believe today, that Internet access and information networks can be considered basic human rights, essential to an individual reaching full potential. We still hold that as a goal for the fund, and for the kind of work represented in this study.

**Jane Leonard**  
**Co-chair, MSNet Fund of**  
**The Minneapolis Foundation**

# 1

## INTRODUCTION

Digital Justice in Minnesota



*PPL Learning Center, Minneapolis*

# 1. INTRODUCTION: Digital Justice in Minnesota

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This report, Digital Justice: Progress towards Digital Inclusion in Minnesota, was produced by the Institute on Race & Poverty (IRP) with the support of the MSNet Fund in Minneapolis. The goal of the project is to assess, on several institutional levels, how well Minnesota is bridging the gap for those with the least access to high technology.

## Digital Justice

The modern workplace requires familiarity and agility with personal computers, word processing software, and Internet research. For people who were exposed to computer technology during their educational years, whether in grade school, high school or college courses, the use of computers on the job is a natural expectation. But for those who grew up before computers became mainstream, the shift to a high tech office in most industries can be daunting. People who have worked in office settings that gradually upgraded their computers and software in recent years have learned along with their coworkers how to use technology to do their jobs more efficiently. But manual labor, retail, food service or manufacturing workers who want to shift to the increasingly information services-dominated economy face tremendous hurdles to gain entry into those sectors.

The emphasis on access to jobs here is deliberate: Information services jobs are largely living-wage jobs, settings in which workers can generate wages sufficient to support a household. Access to computers, broadband services, web-based applications and the Internet in general are all ultimately about access to opportunity. Life opportunities include living-wage employment, housing that is affordable to local residents, social and health services conveniently located and priced, good quality public educational systems, and more. These opportunities vary geographically according to the income mix or racial composition of an area.

IRP is particularly interested in identifying pathways out of poverty, primarily through living-wage jobs, for people of all races and ethnicities. Historically it has been more difficult for people of color to gain entry into living-wage jobs, and the explosion in technology has exacerbated the problem. Even supposedly minimal skills jobs (which offer minimum wage or little more) increasingly require computer skills. Lack of comfort with technology stands as a barrier between a potential employee and a future job, and can lead to poor evaluations once hired. This problem is magnified in higher-wage jobs.

Access to the Internet and the digital economy is an ever-more important means for accessing opportunity. Familiarity with computers and the ability to tap their capabilities can vastly expand an individual's ability to access a fuller range of life opportunities by gaining entry to new job options and higher wages to the individual and his or her family. Yet low-income households and communities of color have lower rates of access to computers, broadband, and the Internet. As cities and counties trim their budgets by putting the applications for their social services, programs and position openings online,



those without access to the Internet or skills to navigate a computer are increasingly left out of the loop.

Just as the environmental justice movement has evolved in response to the disproportionate health and safety impacts on communities of color by polluting land uses, response to the digital divide is in effect an issue of “digital justice.” The disproportionate impacts on those who can least afford extra barriers to opportunity are a matter of digital justice. IRP has undertaken this report in the name of digital justice to fulfill its mission “to ensure that people have access to opportunity and help the places where people live develop in ways that promote access to opportunity.”

Digital justice means that regardless of race, ethnicity, income level or educational background, all people will have adequate access to computers and the Internet, as well as adequate opportunity to learn the skills needed to use the technology. Digital justice means that people have the right to access to the Internet regardless of whether they live in a city, suburb, or a rural area, and that the pricing should not be punitive if they live in a sparsely populated area. School children and their parents should be able to assume that no matter what public school they choose, there will be ample opportunity to use computers and other technology in their classroom experience and assignments. Students should receive this exposure to technology regardless of the location or size of their school. Technology is so pervasive in U.S. culture today that all students and adult citizens require such access to fully participate in the state’s economy. When all of these conditions are met, and underserved populations are able to use technology at a price they can afford, digital justice will have been served.

### **The digital divide in the U.S.**

The digital divide is a broad concept that refers to the gap between those who have access to technology and the skills to use it, and those who don’t. Measuring the divide poses some difficulties; it is simpler to measure access to the Internet than the public’s skill levels using the technology. The Pew Internet & American Life Project, for one, has been comprehensive in its efforts to document the extent to which the public has embraced the Internet. The group conducts frequent national surveys to assess Internet usage by different populations. Their data provide a glimpse of the ways different population groups vary in their access to the Internet.

In their 2006 survey of about 4,000 U.S. adults, they found that about three-quarters of the U.S. population uses the Internet.<sup>1</sup> Men are slightly more likely to use the Internet than women (74 percent of men vs. 71 percent of women use the Internet). [Figure 1]

The younger the person, the more likely they use the Internet. For instance, 88 percent of people aged 18-29 use the Internet, with usage slightly lower for each subsequent age

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<sup>1</sup> Pew Internet & American Life Project, Tracking Survey: February 15 – April 6, 2006, URL: [http://www.pewInternet.org/trends/User\\_Demo\\_4.26.06.htm](http://www.pewInternet.org/trends/User_Demo_4.26.06.htm).

bracket. Persons aged 65+ were the least likely of all groups (age groups as well as any other subcategory) to use the Internet, with just a third of seniors using the Internet.<sup>2</sup>

Race is also a factor in Internet usage; black users are between 10 and 15 percentage points behind white and Hispanic users. The other key determinants are household income and educational attainment. Those earning less than \$30,000 a year are almost 30 percentage points behind the usage rates of even the next income bracket of \$30,000 to \$49,999 a year. Similarly, large gaps exist based upon the level of education attained; the difference between those with a high school diploma and those with some college is a significant 20 percentage points, according to this survey.

Figure 1.

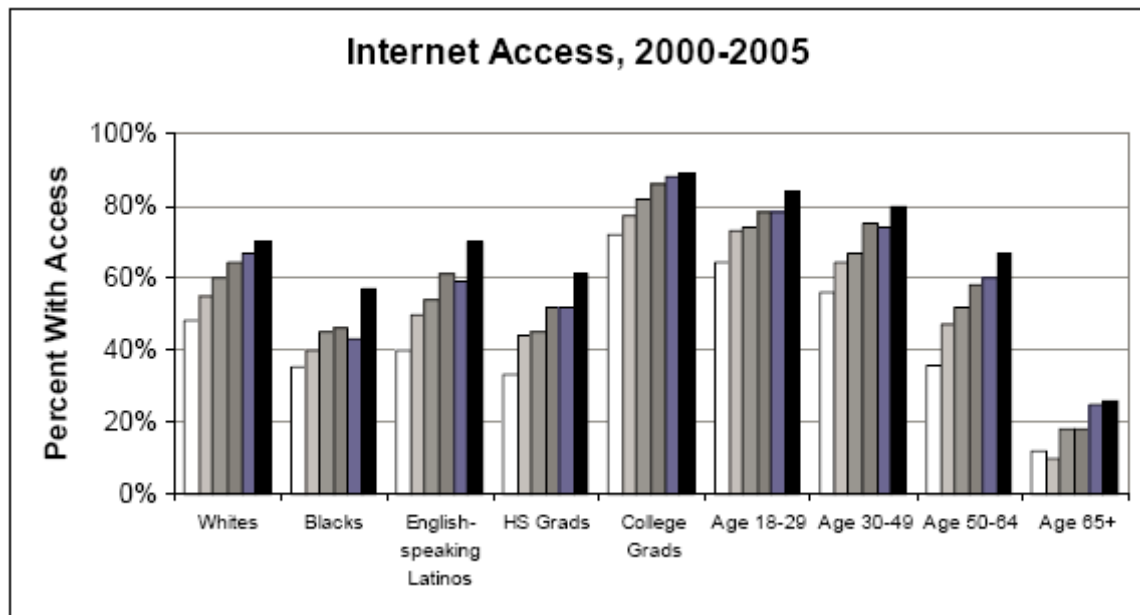
<b>Demographics of Internet Users</b>	
<b>Use the internet</b>	
Total Adults	73%
Women	71
Men	74
<b>Age</b>	
18-29	88%
30-49	84
50-64	71
65+	32
<b>Race/ethnicity</b>	
White, Non-Hispanic	73%
Black, Non-Hispanic	61
English-speaking Hispanic	76
<b>Community type</b>	
Urban	75%
Suburban	75
Rural	63
<b>Household income</b>	
Less than \$30,000/yr	53%
\$30,000-\$49,999	80
\$50,000-\$74,999	86
\$75,000 +	91
<b>Educational attainment</b>	
Less than High School	40%
High School	64
Some College	84
College +	91

Source: Pew Internet & American Life Project, February 15 – April 6, 2006 Tracking Survey. Available at [http://www.pewInternet.org/trends/User\\_Demo\\_4.26.06.htm](http://www.pewInternet.org/trends/User_Demo_4.26.06.htm). N=4,001 adults, 18 and older. Margin of error is ±2% for results based on the full sample and ±2% for results based on Internet users.

<sup>2</sup> A separate Pew Internet & American Life Project report notes that a subset of seniors aged 65+ is highly wired and well connected. See Susannah Fox. “Digital Divides.” The Pew Internet & American Life Project. October 2005, URL: [http://www.pewInternet.org/pdfs/PIP\\_Digital\\_Divisions\\_Oct\\_5\\_2005.pdf](http://www.pewInternet.org/pdfs/PIP_Digital_Divisions_Oct_5_2005.pdf).

The Pew Internet & American Life Project produced a more refined analysis in an October 2005 report entitled “Digital Divides” using survey data collected in May and June 2005.<sup>3</sup> The research in “Digital Divides” finds that while Internet and email usage varies for groups based on race, income and education, the percentage of “truly disconnected” (those who have never used the Internet or email, and do not live in households with Internet connections) remained stable over the preceding three years (2002-2005). In 2005 about one in five adults (22 percent) report they have never used the Internet or email and live in an unconnected home; the figure was 23 percent in 2002.<sup>4</sup> The report shows that there are demographic trends that characterize the truly disconnected; those aged 65 and older, African Americans, and those with less education are overrepresented in the disconnected group [Figure 2].<sup>5</sup> A 2002 Pew study found that persons with disabilities also had strikingly low Internet usage levels; in that survey, 38 percent of Americans living with disabilities reported having access to the Internet.<sup>6</sup>

Figure 2.



Source: Susannah Fox, Pew Internet & American Life Project. “Digital Divisions.” October 2005, p. 1. Each bar in the graph represents a year; the leftmost bar is 2000 and rightmost is 2005.

The 2005 study finds that newcomers to the Internet are relatively rare; just 6 percent of those surveyed reported initiating usage of the Internet within the past year.<sup>7</sup> The author notes that there is a subset of the population that chooses not to go online, even if there is

<sup>3</sup> Susannah Fox. “Digital Divides.” The Pew Internet & American Life Project. October 2005, URL: [http://www.pewInternet.org/pdfs/PIP\\_Digital\\_Divisions\\_Oct\\_5\\_2005.pdf](http://www.pewInternet.org/pdfs/PIP_Digital_Divisions_Oct_5_2005.pdf).

<sup>4</sup> Fox, p. i.

<sup>5</sup> Fox, p. 1.

<sup>6</sup> Fox, p. 2.

<sup>7</sup> Fox, p. 3.

an online connection available in their home. The report finds 15 percent of those surveyed falling into this “Net Evaders” category, down from 20 percent found in 2002.<sup>8</sup>

Differences in Internet connection access speeds are creating a new divide, the 2005 report finds.<sup>9</sup> Having dialup service proves prohibitive for users to do many of the things those with broadband can do, such as making banking or commercial transactions online or downloading large files.<sup>10</sup> While some users do manage to conduct those online activities with a slow connection, they endure long waits and other frustrations, resulting in lower rates of participation in such activities.

Nationally there are striking differences between rates of Internet usage by students of different races.<sup>11</sup> While about two out of three white students (pre-Kindergarten through 12<sup>th</sup> grade) use the Internet, fewer than half of blacks and Hispanics do so.<sup>12</sup> The report concludes that public schools are pivotal in providing computer and Internet access to students who otherwise would not have access.<sup>13</sup>

There are variations in general population Internet usage by U.S. region, as documented by Alan R. Peslak in 2004 using Pew data [Figure 3].<sup>14</sup> In the Upper Midwest (which contains Minnesota) 59 percent of the population use the Internet, putting the region in seventh place out of 12 regions identified in the report. The Upper Midwest’s percentage is also the average for all of the regions.

Figure 3.

U.S. region	Percentage using Internet
Pacific Northwest (Oregon, Washington)	72.2
New England (Connecticut, Maine, Massachusetts, New Hampshire, Vermont, Rhode Island)	71.3
National Capital (Maryland, Virginia, Washington, D.C.)	64.7
California	64.6
Mountain States (Colorado, Idaho, Montana, Nevada, Utah, Wyoming)	63.7
Border States (Arizona, New Mexico, Texas)	61
Upper Midwest (Minnesota, North Dakota, South Dakota, Wisconsin)	59
Lower Midwest (Iowa, Kansas, Missouri, Nebraska, Oklahoma)	56.4
Mid-Atlantic (Delaware, New Jersey, New York, Pennsylvania)	53.3
Industrial Midwest (Illinois, Indiana, Michigan, Ohio)	53.2
South (Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Tennessee, West Virginia)	51.1
Southeast (Florida, Georgia, North Carolina, South Carolina)	45.8

Source: Alan R. Peslak, “Regional and Demographic Differences in United States Internet Usage.”

<sup>8</sup> Fox, p. 3.

<sup>9</sup> Fox, p. 5.

<sup>10</sup> Fox, p. 7.

<sup>11</sup> Matthew DeBell and Chris Chapman. “Computer and Internet Use by Students in 2003.” National Center for Education Statistics. September 2006.

<sup>12</sup> Ben Feller, “Digital divide still separates white and minority students.” USA Today. September 5, 2006. URL: [http://www.usatoday.com/tech/news/2006-09-05-digital-divide\\_x.htm?csp=15](http://www.usatoday.com/tech/news/2006-09-05-digital-divide_x.htm?csp=15). About 47 percent of black students and 44 percent of Hispanic students use the Internet.

<sup>13</sup> DeBell and Chapman, p. iv.

<sup>14</sup> Alan R. Peslak, “Regional and Demographic Differences in United States Internet Usage.” *First Monday*, vol. 9, no. 3 (March 2004), URL: [http://firstmonday.org/issues/issue9\\_3/peslak/index.html](http://firstmonday.org/issues/issue9_3/peslak/index.html).

The author also tested a number of hypotheses to determine any factors and categories that do not exhibit regional variation across the U.S. He found the following: Native Americans, people with post-graduate education, people with incomes over \$100,000, part-time employees, and disabled employees did not exhibit regional variation in their usage of the Internet across the U.S. regions.<sup>15</sup>

Thus the digital divides are many; they cross lines of age, race, income, education, geography, physical ability, and access speed.<sup>16</sup> While the digital divide literature does not shed light on whether the disadvantaged groups fare better or worse in Minnesota, this report documents ways Minnesota is making strides to close the gaps among the affected demographics in the state.

### **The structure of this report**

Given the connection between technology skills and access to living wage jobs and life opportunities, IRP has analyzed the ways that many Minnesota institutions are improving the underserved population's access to technology. Those institutions include community technology centers, public schools, public libraries, municipalities, and Indian reservations. The set of institutions is intended to cover the major players that strive to narrow the digital divide.

IRP also considered geographic difference in delivery of services to Minnesota residents, as geographic location has been a longtime factor in access to technology in any state. Density of the population matters greatly in the delivery of broadband and wireless services, such that more densely settled places can be served at less cost than sparsely populated places. Delivery of broadband Internet services is following the path of the delivery of telephone services decades ago. The high cost of providing the same level of service to the handful of residents at the ends of the system as are provided to urban centers, known as the "last mile" problem, led to federal regulation to maintain service at a fair cost to all. As telephone service had to be deemed a right of all people, so now is Internet access the next challenge for policymakers grappling with the right of all residents to minimum service at a fair price. And so by necessity IRP kept geography in mind as it approached each institutional assessment.

The institutions covered in the report are as follows:

**Community technology centers (CTCs)** are public computer centers that can be housed in any number of settings, such as within libraries, collocated with other small businesses, or as their own nonprofits. CTCs generally aim to serve the broad populace in their vicinity that does not already have regular access to computers or the Internet. They are

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<sup>15</sup> Peslak, "Summary and Conclusion." [Page not available; journal only available online.] By implication, there was significant regional variation in usage of the Internet by all other races, education attainment levels, incomes, and employee status, though the author found the data inconclusive and did not provide it in his report.

<sup>16</sup> Additional gaps have been found in family/household type, employment status, parent education attainment, household language, and other demographic factors, but they were not considered in the scope of this report. See DeBell and Chapman and Fox.

places where people can improve their computer skills, take classes in specific software or other applications, and can use email, play games, read material on the Internet, or conduct job searches and apply for openings. There are CTCs throughout the state, many in urban neighborhoods as well as suburban and rural settings. They strive to link underserved populations to technology. IRP conducted a survey of 83 CTC directors to determine what they offer at their facilities and how well they are doing in their mission. IRP also surveyed about 400 CTC adult users to hear their assessment of how well served they are by the CTCs they use.

IRP only surveyed CTC users over the age of 18 in order to hear from the potential working population using CTCs. To learn more about how children and teenagers access technology, IRP chose the public schools as the setting for analysis since schooling is a common experience for youths where the penetration of technology can be measured. Certainly many youths have computers in their homes and may be using gaming software, email, or Internet sites for entertainment or research, but it was not feasible for IRP to assess home usage in the scope of this project.

To determine how school-aged children access technology, IRP reviewed the technology plans for four **public school districts**: the Minneapolis Public School District, the St. Paul Public School District, the Edina Public School District, and the Greenway Schools – ISD #316 (a collection of rural schools in eastern Itasca County, Minnesota).<sup>17</sup> The state of Minnesota requires all public school districts to develop three-year technology plans to be eligible to receive state or federal funding for technology initiatives. IRP chose select technology plans to represent the urban, suburban and rural regions of the state. IRP chose these types of regions to compare the visions for the incorporation of technology into curriculum in three regionally distinct areas.

Since a high proportion of CTCs are located in **public libraries**, it was important for IRP to explore the connection between library settings and their commitment to providing access to technology. During the CTC survey process, one public library system stood out from the rest in the ways it had incorporated technology into its mission, programming and facilities. IRP interviewed Hennepin County Library staff and officials at the Brookdale Library to capture the breadth of their planning and actions that make computer capability a core tool for library users and a potential model for other institutions seeking ways to approach the digital divide holistically.

When IRP embarked upon this report on digital justice, the **City of Minneapolis** was seeking a vendor that could build a wireless network throughout the entire city. While the vendor search may have begun as a straightforward technology purchase, energized citizens encouraged the city council to think more broadly and consider what community benefits could be built into the contract. The Digital Inclusion Task Force members worked together with Minneapolis city officials to delineate the terms the city should set forth in its contract with the selected vendor. The winning bidder, US Internet, will put \$500,000 plus a portion of its profits into a digital inclusion fund, will set up a “walled

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<sup>17</sup> The Greenway School District encompasses schools in the communities of Bovey, Calumet, Coleraine, Cloverdale, LaPrairie, Marble, Pengilly and Taconite.

garden” of free city and neighborhood information web sites, and will provide up to 90 multi-lingual log-in sites, among other community benefit provisions. Municipalities around the country have been taking similar measures to create wireless cities for public safety reasons, particularly in light of the communications failures of 9/11. Many cities are turning to the lead Minneapolis officials and community organizers in an attempt to replicate their process and hopefully their success as well.

IRP recognized that when it comes to the rural areas of Minnesota, the **Native American reservations** have their own concerns when it comes to access to technology. Issues of network ownership are complicated by sovereignty on the lands. The federal government has developed numerous grant programs specifically for tribes in order to bolster their technological capacities.

The final section of this report is a discussion of the **findings** noted throughout the report. In each area of inquiry, IRP found useful information that suggested promising solutions. IRP has compiled those recommendations that sometimes cut across institutional layers.

### **Special thanks**

Principal investigator Jill Mazullo would like to thank many people for their work on this report. Eric Myott helped develop the survey questions and provided the CTC survey analysis, graduate assistant Katherine Flynn assisted with survey collection, legal research and data collection, and Dawn Hoover collaborated on a portion of the public schools study. Sarah Koschinska, Catherine Settanni, Peg Schmook, and Amanuel Godefa provided photos of their computer labs for use in this report. This report would not have been possible without the support of the MSNet Fund and the Minneapolis Foundation. Minneapolis Foundation officer Joanne Walz provided helpful guidance at various points during the development of this report. IRP wishes to thank Jane Leonard for her contribution of a foreword, and Catherine Settanni for her contagious enthusiasm for the digital justice cause.

# 2

## PUBLIC LABS

Meeting the Public Demand for Access



*PPL Learning Center, Minneapolis*



## 2. PUBLIC LABS: Meeting the public demand for access

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Community Technology Centers (CTCs) provide computer and information technology in labs that are open to the public with the intent of serving people who lack access to these technologies. Accessibility to digital technology includes the capacity of people to interact with computer-related technology, having the skills to use technology, to develop life skills and to foster personal and community empowerment.

CTCs serve communities and individuals that lack access to technology by providing computers with Internet access, training people to use computer hardware and software products, provide in-house services to help CTC users one-on-one and/or by tailoring their services for particular underserved populations.

CTCs that largely serve specific racial or cultural communities that lack access to technology tend to provide specialized services to assist people learning the English language or to provide help in accessing housing, education and employment opportunities, among other services. CTCs that tend to serve the general public are often libraries that provide computers to all interested patrons. While libraries often direct their computer technology resources toward their own facilities or systems, they often find themselves spending significant time and resources on their patrons who are newcomers to computer-information technology.

CTCs are often located in urban neighborhoods where people face a nexus of poverty and racial segregation, or are located in rural communities that may lack information technology resources, a developed IT economy or advanced infrastructure for broadband. CTC directors and staff expressed similar concerns at the 2004 Minnesota Digital Justice Conference, namely that they saw intense demand for too few computers, and they had difficulty retaining qualified staff members, who were strong candidates for more lucrative IT jobs.

### Highlights of the survey results

IRP conducted two surveys of CTCs for this report between April and August 2006. The first survey asked CTC directors to provide information about their public computer lab's location, staff capacity, infrastructure, community served, programming, funding, and outcomes. The 83 CTCs surveyed included library labs as well as nonlibrary sites, and included urban, suburban and rural locations in the Twin Cities metro and in 12 northern Minnesota counties.<sup>1</sup>

The second survey asked over 400 users of 22 CTCs to assess their satisfaction with computers, programming and staff capacity at the public computer lab they use, and to note any outcomes they have achieved due to their association with the CTC.

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<sup>1</sup> The northern Minnesota counties represented in the survey include the following: Aitken, Becker, Beltrami, Carlton, Cass, Clearwater, Hubbard, Itasca, Koochiching, Lake of the Woods, Mahnomon, and Mille Lacs.

Highlights of the survey results include the following:

- The most common benefit CTC users report from their association with a CTC is that it led to a job interview (22 percent) or resulted in being hired (12 percent). These rates double for users of non-library, central city CTCs.
- While users rated high satisfaction for the location of their CTC sites, they were less apt to be satisfied with the hours the CTC provides, implying that time is more of an impediment to users than the actual location of the CTCs.
- CTC users traveled farthest to reach suburban CTCs (5.6 miles) than in other parts of the state; people accessing rural CTCs traveled an average of 4.7 miles. Suburban CTC users were also the most reliant on cars to reach the CTCs.
- Word of mouth is the most effective means of encouraging new patrons to begin using CTCs.
- Almost 40 percent of the CTCs serve user populations that are one-third or more black (African-American or African immigrant), Hispanic or Asian.
- Hmong speakers tend to be underrepresented in both CTC user and staff populations.
- Typical staff sizes at rural CTCs are 2 to 4 times smaller than metro-area CTCs and there are a third fewer computers at the rural sites.

### **Details of the survey results**

IRP reports the survey results from the standpoint of the user accessing the CTC site. Initially CTC users have to know about places where they can access computer-related technology. Many users learn of CTCs through word of mouth from others who know about the site. When learning of a center a user must find a way to access the location, which most users do by automobile in rural and suburban areas, while in central cities users often find alternative means of transportation to the CTC. Interestingly rural users tended to travel less distance and were less automobile dependent than suburban users of CTCs. Overall, users were most often very satisfied with the location of the centers.

Arriving at the CTC, users have to connect with computers and staff. Users that attend CTCs are often those traditionally lacking access to computer technology, including Hispanics and African Americans, though Asians and Hmong, in particular, appear to be underrepresented. IRP also finds that CTCs with few computers or staff often serve larger user populations. Rural CTCs in particular had relatively few computers and staff at their sites compared to their Twin Cities counterparts.

When users come to a CTC, they often seek services to better understand computer technology or to attain broader goals such as increasing education and employment skills. The survey results present evidence that Twin Cities CTCs provide employment-related services less often than users attempt to access them. When accessing job services provided by CTCs, users often succeed in obtaining a job interview or employment. To sufficiently provide these resources CTCs require adequate funding. Of the directors surveyed for the study, 77 percent reported that a lack of funding was an impediment for their CTCs to reach their goals.

While another common impediment for CTCs to reach their goals was staff training (37 percent), it remained a second or third choice for CTC directors on how they would spend future grant money after purchasing new computers or software and hiring staff. This implies that CTCs struggle to provide their basic functions and that better coordination and funding are necessary for CTCs to provide the kind of services to users that help them learn computer technology, but also empower them to attain broader life skills and goals.

### **Public awareness of CTCs**

To access public computer technology and services an individual first need be aware of places where access is provided. When asking the directors about what impedes their CTC from reaching their goals, 19 percent reported a lack of publicity for the site.<sup>2</sup>

The most common means for users to learn about CTCs varied with the location of centers and between directors and users. Most directors responded that users learned about their center through word of mouth communication (more than 90 percent). However, in suburban libraries, the percentage was only 60 percent. On the other hand, users reported learning about the CTC through word of mouth only about 50 percent of the time – the shares were 60 percent for non-library users but only 27 percent for suburban library users [Figures 4 and 5].

For suburban library users, community newsletters and “other ways of learning about the center” were more common than for users of other CTCs. Suburban library users were more likely to learn about the site through a newsletter (11 percent) than other locations, even though suburban libraries were much less likely to advertise using newsletters (20 percent) than their central city counterparts (56 percent).

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<sup>2</sup> See Appendix C, Directors’ survey results, Section 9, Question 3

**Figure 4: Methods of Advertisement Used by CTCs**

	Total			Central City			Suburbs	Rural
	Total	Library	Non-Library	Total	Library	Non-Library	Library	Library
Word of Mouth	95.5%	90.0%	100.0%	100.0%	100.0%	100.0%	60.0%	93.3%
Community Newspaper	54.5%	70.0%	41.7%	35.3%	60.0%	25.0%	80.0%	73.3%
Radio	21.2%	40.0%	5.6%	5.9%	20.0%	0.0%	40.0%	53.3%
Newsletter	45.5%	30.0%	58.3%	55.9%	60.0%	54.2%	20.0%	13.3%
Other	50.0%	60.0%	41.7%	58.8%	80.0%	50.0%	100.0%	33.3%
Other common responses (total): brochures/flyers (20%), web page (14%)								

**Figure 5: How Users Became Aware of the CTC**

	Total			Central City			Suburbs	Rural
	Total	Library	Non-Library	Total	Library	Non-Library	Library	Library
Word of mouth	48.7%	45.2%	61.6%	51.2%	39.5%	61.6%	27.3%	53.1%
Advertisement	5.1%	4.5%	7.0%	5.6%	3.9%	7.0%	1.8%	5.6%
Community newsletter	7.3%	6.8%	9.3%	8.6%	7.9%	9.3%	10.9%	5.0%
Billboard/Announcement	2.3%	1.9%	3.5%	3.7%	3.9%	3.5%	0.0%	1.7%
Other	45.7%	49.4%	32.6%	43.8%	56.6%	32.6%	61.8%	42.5%
Other common responses (total): found through library (11%), walk by (6%), drive by (4%), live nearby (4%)								

## Accessibility

To access CTCs people consider the distance and associated time it takes within their schedules to be able to visit a center and interact with people and technology. People who do not have home or work access to computers or the Internet are more likely than the average population to also lack access to a car, which is sometimes the only way to reach a CTC. Indeed, CTCs typically serve populations whose incomes are under \$25,000 a year, for whom car ownership is not a given.<sup>3</sup>

On average a CTC user travels about 4.7 miles to the site. Whether the CTC was a library, or not, mattered for distances traveled, with library users traveling an average of 3.4 miles and non-library users traveling 5.2 miles in the central cities. Interestingly users reported traveling shorter distances in rural CTCs (4.7 miles) than suburban CTCs (5.6 miles).<sup>4</sup>

<sup>3</sup> See Appendix C, Directors' survey, Section 6, Question 12

<sup>4</sup> See Appendix F, Users' Survey, Section 2, Question 3

**Figure 6: Transportation-related Accessibility at the CTC site**

	Total	Central City
Bus	68.3%	95.0%
Light Rail/Train	13.4%	25.0%
Parking Lot	70.7%	62.5%
Bike Racks	72.0%	72.5%
Walking Distance	90.2%	95.0%
Other	18.3%	17.5%

The least expensive means of travel, walking or biking, are supported by most CTCs. According to directors, 90 percent of CTCs were within walking distance of significant numbers of users and 72 percent provided bike racks at their CTCs.<sup>5</sup> In turn 17 percent of users walked to CTCs and 4 percent biked to the sites (Figures 6 and 7).<sup>6</sup>

**Figure 7: User Modes of Transportation to the CTC**

	Total	Central City
Bus	10.4%	25.3%
Walking	17.2%	21.7%
Bike	3.9%	4.2%
Light Rail	0.2%	0.6%
Carpool/Vanpool	2.9%	1.8%
Automobile	63.3%	42.8%
Other	1.9%	3.6%

Directors also reported more often having favorable conditions for traveling to the site via alternative motorized modes of travel. Good accessibility by bus was reported by 68 percent of directors; 95 percent in the central cities. In turn, users reported using the bus to access the CTC 10 percent of the time; 25 percent of the time for central city users. Not surprisingly, bus travel was relatively difficult for rural centers. Only 29 percent of rural directors said the site was accessible by bus and only one-half of one percent of rural users used the bus.<sup>7</sup>

Automobiles were the most common mode of travel to CTCs. Sixty-three percent of all users reporting driving alone to the CTC. However, less than half of central city CTC users (43 percent) traveled in a single-occupancy automobile. Directors, in turn, reported providing parking lots 71 percent of the time, 62.5 percent in the central cities. Rural users were less likely to drive alone (74 percent) than suburban users (87 percent).<sup>8</sup>

Overall, the overwhelming majority of users were satisfied with the location of the CTC. Ninety-five percent rated the CTC location as satisfactory or very satisfactory. This percentage varied very little whether the CTC was located in a central city, suburb or rural area or whether if the CTC was in a library or not. Only 6 percent of directors thought site accessibility was an impediment to reaching their goals.<sup>9</sup>

## Staffing and hours

New computer users often need help performing basic operations on a computer. Developing computer skills at a CTC requires the user to find blocks of time in their schedule when they can get to the CTC when the lab is open or class is in session.

<sup>5</sup> It mattered little whether the CTC was located in urban or rural areas, though libraries were more likely to be within walking distance and have bike racks. See Appendix H, Table 1.

<sup>6</sup> Users were 1 ½ times more likely to walk to CTCs that were not libraries, while users were more than three times more likely to take the bike to a library CTC. See Appendix H, Table 2.

<sup>7</sup> See Appendix H, Table 2.

<sup>8</sup> Ibid.

<sup>9</sup> See Appendix F, Users' survey, Section 3, Question 3C.

Immigrant groups learning English also face impediments to developing computer skills when the computer content is in a language they are just beginning to learn.

Communities of color more often face disparities in computer ownership and usage.<sup>10</sup> The directors' survey results show that some CTCs serve large proportions of users from racial minority groups that generally have less access to computer

technologies. African Americans and Hispanics in particular often represent large proportions of users at CTCs, Asians tend to show smaller shares even though their statewide and metropolitan population numbers are about the same size as the African American and Hispanic populations [Figure 8].

**Figure 8: CTCs by Racial Composition of Users**

Percentage of Users	African American	Asian	Hispanic
0 to 15%	25 (47%)	37 (82%)	33 (70%)
15 to 31%	6 (11%)	4 (9%)	8 (17%)
32 to 47%	6 (11%)	1 (2%)	3 (6%)
48 to 63%	5 (9%)	3 (7%)	0
64 to 79%	8 (15%)	0	0
80 to 95%	2 (4%)	0	1 (2%)
> 95%	1 (2%)	0	2 (4%)

Users can access community technology centers only as CTC hours of operations allow. On average CTCs are open 7.6 hours on weekdays and 1.5 hours on weekends. Typical CTC hours are 10 a.m. to 6 p.m. on weekdays and 10 a.m. to 4 p.m. on weekends.<sup>11</sup> Though most users responded favorably about the hours the CTC provides, almost 22 percent of users were less than satisfied with the hours the CTC provides.<sup>12</sup>

**Figure 9: Relationship Between Number of CTC Users and Computers**

Users per Month:	Computers				Total
	1 to 6	7 to 10	11 to 18	>= 19	
< 25	2	2	1	5	10
25 to 49	2	4	3	1	10
50 to 99	1	1	4	3	9
>= 100	7	11	12	9	39
Total	12	18	20	18	68

**Figure 10: Relationship Between Number of CTC Users and Staff**

Users per Month:	Staff				Total
	1 to 2	3 to 5	6 to 10	11 or more	
< 25	6	0	1	2	9
25 to 49	2	3	2	0	7
50 to 99	2	3	0	2	7
>= 100	6	5	13	11	35

When new computer users arrive at a CTC they often need the assistance of a staff person who can help answer questions. Users generally report being highly satisfied with staff, regardless of where the CTC was located, with 65 percent to 75 percent reporting they were highly satisfied with staff.<sup>13</sup> However, CTCs with small staffs and few computers often serve larger user populations [Figures 9 and 10]. Nearly half of the CTCs reporting the most users per month (more than 100) also reported that they have 10 or fewer computers. Supply is more problematic for rural CTCs where there are greater distances between

<sup>10</sup> Fox. "Digital Divides."

<sup>11</sup> See Appendix H, Table 3

<sup>12</sup> See Appendix F, Users' survey, Section 3, Question 3D.

<sup>13</sup> See Appendix H, Table 4.

CTCs, and where typical staff sizes are just one-fourth to one-half of their metro counterparts.<sup>14</sup>

Most users were also satisfied with the quality of computers in CTCs, although about 17 percent of central city CTC users were less than satisfied with the quality of computers, and 25 percent of the users of central city libraries were less than satisfied.<sup>15</sup>

**Figure 11: Relationship of Users and Staff Who Speak Non-English Languages in CTCs**

		Fraction of CTCs With Staff Member that Speaks:			
		Hmong	Spanish	Somali	Other
Percentage of CTC Users that Speak Other Than English	0%	0 / 13	1 / 10	0 / 10	1 / 8
	1 to 15%	2 / 19	9 / 20	9 / 20	9 / 23
	15 to 31%	2 / 2	4 / 5	4 / 5	0 / 2
	32 to 47%	2 / 2	5 / 5	5 / 5	
	48 to 63%	0 / 1	2 / 2	2 / 2	
	64 to 79%			1 / 1	
	80 to 95%			1 / 1	1 / 1
	> 95%		3 / 3		
Total		6 / 37	24 / 45	9 / 38	11 / 34

According to the directors' survey, most CTCs with sizable proportions of users that speak a language other than English also have staff members that speak that language. However, the one CTC in the survey with a significant percentage of Hmong speakers reported that it had no staff members who speak Hmong. Given the small percentages of Asians and Hmong in the CTC sample, more research is warranted to determine if those groups are being underserved by CTCs or other community technology initiatives [Figure 11].

Other language groups appear to be better served. Thirty-seven percent of CTCs report a Spanish-speaking staff member, followed by "other" languages (27 percent), Somali (16 percent) and Hmong (10 percent).<sup>16</sup>

### Types of services provided

Most CTCs in the survey focus (40 percent of time or more) on providing Internet services, regardless of where they are located or whether or not they are housed in a library. The most common service accessed by CTC users is the Internet [Figures 12 and 13]. About 26 percent of libraries also offer educational services and 21 percent of users reported using them.

The next most common services accessed by users were job skills training or job searches. These were particularly common services in central city CTCs. Yet directors responded that they did not devote large amounts of time on employment and training services. No central city CTCs (other than libraries) reported spending over 40 percent of

<sup>14</sup> See Appendix H, Table 5.

<sup>15</sup> See Appendix H, Table 6.

<sup>16</sup> See Appendix C, Directors' survey, Section 4, Question 2.

time on employment and training services, even though job skills and searches occurred with 65 percent of non-library central city users.<sup>17</sup>

**Figure 12: Directors' Survey: Percentage of CTCs Devoting over 40% Time to Particular Services**

	Total			Central City			Suburbs	Rural
	Total	Library	Non-Library	Total	Library	Non-Library	Library	Library
Education	26.0%	20.8%	30.8%	20.0%	14.3%	22.2%	0.0%	40.0%
Access to the Internet	58.2%	59.3%	57.1%	55.6%	75.0%	47.4%	57.1%	50.0%
Employment and Training	17.8%	22.7%	13.0%	9.5%	28.6%	0.0%	14.3%	25.0%
Computer Literacy	20.0%	26.1%	13.6%	23.8%	42.9%	14.3%	0.0%	33.3%
Health Care	6.1%	6.7%	5.6%	12.5%	25.0%	8.3%	0.0%	0.0%
Family Services	3.0%	6.7%	0.0%	6.7%	25.0%	0.0%	0.0%	0.0%
Other Services	37.9%	27.3%	44.4%	43.8%	66.7%	38.5%	0.0%	20.0%

Other services with over 40% time spent (total): library services (31%)

**Figure 13: Users' Survey: Services Accessed by User**

	Total			Central City			Suburbs	Rural
	Total	Library	Non-Library	Total	Library	Non-Library	Library	Library
None	1.4%	1.5%	1.1%	1.2%	1.2%	1.1%	0.0%	2.1%
Computer training	11.1%	7.4%	24.7%	15.9%	6.2%	24.7%	7.4%	7.9%
Job search	33.3%	24.6%	65.2%	47.1%	27.2%	65.2%	29.6%	22.1%
Job skill training	11.8%	4.6%	38.2%	22.9%	6.2%	38.2%	3.7%	4.2%
Internet	87.0%	92.9%	65.2%	78.8%	93.8%	65.2%	98.1%	91.1%
Software training	3.4%	1.8%	9.0%	5.3%	1.2%	9.0%	1.9%	2.1%
Education	20.8%	19.4%	25.8%	21.8%	17.3%	25.8%	20.4%	20.0%
Other	15.2%	12.6%	24.7%	20.6%	16.0%	24.7%	5.6%	13.2%

Other services responses (total): learning Microsoft Office software products (4%)

However, a quarter of directors included mission language about employment services — 29 percent offered job search<sup>18</sup> and 20 percent offered job-training classes,<sup>19</sup> while overall a third of all patrons used job search resources and 11 percent used job skills programs at CTCs.

Three-quarters of users said they were satisfied to very satisfied with the range of services offered by their CTC. Just over 8 percent of users were less than satisfied with the programs offered at the CTC.<sup>20</sup>

<sup>17</sup> While these findings on employment training/seeking services could be limited to the fact that a large proportion of the users (47%) were from a CTC that specializes in employment, the proportion of non-library users excluding the employment specialty CTC were quite high seeking job searches (50%) and job skills training (44%).

<sup>18</sup> See Appendix D, Directors' survey open-ended responses, Section 3, Question 4.

<sup>19</sup> See Appendix C, Directors' survey, Section 7, Question 1.

<sup>20</sup> See Appendix F, Users' survey, Section 2, Question 3F



## Outcomes

CTC directors reported that they are most concerned with computer access, providing services, and reaching societal goals. Directors often consider user success in both functional and broader terms. Most commonly, CTC directors responded that success was measured by how often the CTC or its computers were used. About half of the directors who said success at their CTCs is equivalent to computer use also included broader explanations, such as meeting educational goals, improving life situations and enabling self-empowerment.<sup>21</sup>

Most directors (60 percent) also responded that they tracked outcomes at their CTCs. Of all directors that tracked outcomes, 50 percent did so by measuring the number of people trained followed by tracking the number of courses offered (35 percent) and the number of users at the CTC (20 percent).<sup>22</sup> [Figure 14]

Users reported a wide variety of outcomes from CTC services. Most commonly, they reported that attending a CTC led to a job interview (22 percent) or being hired for a job position (12 percent). These rates double for non-library, central city CTC users. Other common results for users attending a CTC include obtaining other social services (15 percent), taxes filed (13 percent) followed by health care obtained, apartment rented and email communication (6 percent each).<sup>23</sup>

**Figure 14: Users' Survey: Results From Attending CTC**

	Total			Central City			Suburbs	Rural
	Total	Library	Non-Library	Total	Library	Non-Library	Library	Library
Led to job interview	22.1%	16.0%	43.9%	32.7%	19.7%	43.9%	26.9%	11.2%
Hired for job position	12.0%	8.2%	25.6%	17.6%	8.5%	25.6%	13.5%	6.5%
Home purchased	2.1%	2.0%	2.4%	2.0%	1.4%	2.4%	3.8%	1.8%
Apartment rented	5.6%	3.8%	12.2%	7.8%	2.8%	12.2%	3.8%	4.1%
Health care obtained	6.4%	6.5%	6.1%	7.2%	8.5%	6.1%	9.6%	4.7%
Other social services	14.7%	12.3%	23.2%	19.0%	14.1%	23.2%	7.7%	12.9%
Taxes filed	13.1%	15.7%	3.7%	11.8%	21.1%	3.7%	15.4%	13.5%
No results	24.0%	25.9%	17.1%	19.6%	22.5%	17.1%	23.1%	28.2%
Other	44.0%	46.4%	35.4%	41.8%	49.3%	35.4%	40.4%	47.1%

Other responses (total): email (6%), other job-related (4%), GED, other education (4%)

Users placed a high level of importance on accessing employment services at their CTCs. Of all users that responded to using job services, 45 percent responded that this led to a job interview and 23 percent reported being hired for a job. For those users that have had job skills training at a CTC, 45 percent reported having a job interview and 24 percent claimed to have been hired for a position.

<sup>21</sup> See Appendix D, Directors' survey open-ended responses, Section 9, Question 2.

<sup>22</sup> See Appendix C, Directors' survey Section 9, Question 1.

<sup>23</sup> Email communication was a major category from "other" results, see Appendix G, Users' survey open-ended responses, Section 3, Question 7.

## Funding levels

Funding is a prerequisite for CTCs to maintain a lab and office, employ staff, make available computers and provide services to connect those that lack access to computer-related technology. Of all directors surveyed, nearly half of them reported receiving funding through government sources in the prior year, usually state, county or local sources or some combination of them.<sup>24</sup> Of all directors surveyed, a third of them reported receiving grants in the prior year. Though grants came from various sources, the most commonly mentioned source was the Bill and Melinda Gates Foundation.<sup>25</sup>

Funding issues appear to be important. Three-quarters of directors reported funding being an impediment to reaching its goals followed by a lack of staff training (38 percent).<sup>26</sup> When asked to rank how new grant funding could be used for the CTC, directors gave the greatest weight to purchasing new computers and software as well as hiring new staff.

*Figure 15: If directors received a large operating grant tomorrow?*  
**Ranked top three expenditures for grant**

	#1	#2	#3	N responses	Response Average
New Computers	23	11	11	45	1.73
New Software	6	22	14	42	2.19
Hire New Staff	24	9	3	36	1.42
Training for Staff	5	12	10	27	2.19
New Site	6	1	4	11	1.82
Publicize the CTC	0	1	11	12	2.92
Other	1	4	5	10	2.40

Though staff training was often cited as an impediment for CTCs reaching their goals, it usually was the second or third choice for directors if given a grant. Building a new site or publicizing the CTC were low priorities for directors, reflecting the generally high user satisfaction with the site location and the fact that users often learned about CTCs via word of mouth.

<sup>24</sup> See Appendix D, Directors' survey open-ended responses, Section 8, Question 2.

<sup>25</sup> See Appendix D, Directors' survey open-ended responses, Section 8, Question 1.

<sup>26</sup> See Appendix C, Directors' survey, Section 9, Question 3.

# 3

## SCHOOLS

Integrating Technology into K-12 Curriculum



*PPL Learning Center, Minneapolis*

### 3. SCHOOLS: Integrating Technology into K-12 Curriculum

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Technology is touted as a must in primary and secondary schools. Teachers feel pressure to incorporate new digital tools in their classrooms, whether they are desktop computers, laptops, software applications or interactive whiteboards. Sometimes the initiative comes from a forward-thinking principal; other times the teacher is the one to initiate the integration of new technology in their classroom. But in every instance, educators should be sure that after the technology tool arrives, teachers know how to use the tool (or have students teach them) and how to incorporate it into their curriculum.

According to one technology reporter, there are four stages of technology adoption in the schools: dabbling, doing old things in old ways, doing old things in new ways, and best yet, doing new things in new ways.<sup>1</sup> In the dabbling stage of tech adoption, teachers may try out a new software application or create their own and then set it aside, then try another; no real implementation occurs. Doing old things in old and even new ways is not a radical shift; placing lesson plans online is a good step but it is not yet influenced by the technology. Doing new things in new ways means that technology has made new ways of teaching and learning possible. It requires engaging the students and making learning relevant to their lives.

When teachers are comfortable with technology and can draw on their tech tools as readily as chalk and pencils, great things happen. Students deliver positive reviews of these innovations:

- Three million students virtually followed Arctic explorers on a trek called GoNorth! ANWR 2005 developed by professors at the University of Minnesota.<sup>2</sup>
- Some classes use Google Earth to “visit” any place they discuss, viewing aerial images as well as up close photographs of real places they read about in school.
- Teachers call up artworks from all over the world on their screens to share with students at a moment’s notice.
- Students use iMovies to create group projects and share them with others, learning about camera work, editing and film software along the way.

When technology is no longer an add-on but instead an integral part in their education, children respond accordingly; students begin to make comments like “I love my computer” and “It’s part of the family.”<sup>3</sup>

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<sup>1</sup> Marc Prensky. “Adopt and Adapt: 21st-Century Schools Need 21st-Century Technology.” Edutopia, December 2005. URL: [http://www.edutopia.org/magazine/ed1article.php?id=Art\\_1423&issue=dec\\_05](http://www.edutopia.org/magazine/ed1article.php?id=Art_1423&issue=dec_05)

<sup>2</sup> Amy Wood. Snow Days. Edutopia, February 2005. URL: [http://www.edutopia.org/magazine/ed1article.php?id=Art\\_1227&issue=feb\\_05](http://www.edutopia.org/magazine/ed1article.php?id=Art_1227&issue=feb_05)

<sup>3</sup> Tom Greaves. A One-to-One Future. Edutopia, Nov. 15, 2006. URL: [http://www.edutopia.org/php/article.php?id=Art\\_1673&key=137](http://www.edutopia.org/php/article.php?id=Art_1673&key=137)

Researchers have noticed, however, that such attachment requires making a serious commitment to the students, particularly in the form of providing one laptop for every student.<sup>4</sup> When students are able to plaster their laptop with stickers, choose their own homepage and take the machine home with them at night, transformative things happen. If instead the school makes laptops available on a wheeled cart that is shared among classrooms, ownership and transformation is not in evidence.<sup>5</sup> Even a ratio of two students to one computer is inadequate and does not foster the same level of attachment.<sup>6</sup> One-to-one computing is certainly expensive to accomplish, though analysts anticipate continued price declines for laptops, making more school districts able to move toward one-to-one computing, as has been done in Maine; Vail, Arizona; Florida's Broward County Schools; and the Lemon Grove School District, in Lemon Grove, California.<sup>7</sup>

The American Association of School Administrators sees the rise of technology fundamentally changing how we define "school" and "teacher":<sup>8</sup>

"Schools" will go from "buildings" to nerve centers, with walls that are porous and transparent, connecting teachers, students and the community to the wealth of knowledge that exists in the world.

"Teacher" will move from primary role as a dispenser of information to orchestrator of learning and helping students turn information into knowledge, and knowledge into wisdom.

Schools in the 21<sup>st</sup> century will ideally have full access to technology, but what might that look like? According to 21<sup>st</sup> Century Schools, a consulting firm that works with public school districts, schools should have these components:<sup>9</sup>

- If students do not have computers or access to the Internet at home, schools should provide it for them.
- Schools should obtain laptops for every student and teacher.
- Buildings will need to be wired in such a way that students can access their files, as well as the Internet, from anywhere in the school.
- Various labs and learning centers should be set up around the campus.

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<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

<sup>7</sup> One-to-one computing in the U.S. noted in Prensky. Also see John Markoff, "For \$150, Third-World Laptop Stirs Big Debate," NY Times, Nov. 31, 2006. URL: <http://www.nytimes.com/2006/11/30/technology/30laptop.html>.

<sup>8</sup> Possibilities for 21<sup>st</sup> Century Education. URL: [http://www.21stcenturyschools.com/What\\_is\\_21st\\_Century\\_Education.htm](http://www.21stcenturyschools.com/What_is_21st_Century_Education.htm)

<sup>9</sup> Ibid.

- Art, music, theatre, television, radio and film studios can be created with relatively small expenditures.
- All classrooms should have televisions to watch broadcasts created by their school as well as by other schools in the district.

Other education researchers say cell phones should never be banned from schools; on the contrary, they should be welcomed as tech tools that many students already own.<sup>10</sup> Los Angeles teacher Ron Smith views cell phones as portable personal computers already owned by nearly every student, even in his urban school where rates of student poverty are high.<sup>11</sup> “The cell phone may be used as a computation device, camera, text-messaging device, portable storage device, music player, word processor, and probably more,” says Smith. “Why on earth would I take that from my students?”

Other tools, often blocked by schools but desired by students, include instant messaging, unfiltered Internet access and the use of the online encyclopedia, Wikipedia, despite their potentially effective educational roles.<sup>12</sup>

An additional tool that is finding its way into many classrooms is the digital whiteboard. Whiteboards are the modern-day chalkboard with interactive capacity. Consider this anecdote from Sam Barnes, reporter for the *Star Tribune*:<sup>13</sup>

You enter through the school’s on-line portal, go to Nelson’s lessons and click on the chapter one review. In front of you appears a screen that resembles a page of questions at the end of a textbook chapter.

Next you hear Nelson’s voice. He’s reading the questions out loud, much as he might during class.

Then magically, writing starts to appear after the question. It’s as if an invisible red pen is writing out the solution. But what you are seeing is Nelson solving the problem, step-by-step, explaining each move as he goes along, just as he would on a tablet PC in his classroom. He recorded this lesson for his class, and now a student can replay it at home as many times as necessary until he gets it.

“It’s like having a teacher in front of you at night,” says Nelson. “It can let kids use my instruction at their own pace.”

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<sup>10</sup> Grace Rubenstein. Cell Sanity: Cell phones switch from foe to friend. Edutopia. September 2006. URL: [http://www.edutopia.org/magazine/ed1/article.php?id=Art\\_1625&issue=sep\\_06](http://www.edutopia.org/magazine/ed1/article.php?id=Art_1625&issue=sep_06)

<sup>11</sup> Ibid.

<sup>12</sup> Prensky.

<sup>13</sup> Sam Barnes. The Internet offers great new ways for kids to master their lessons. *Star Tribune*, Oct. 4, 2006, p. 2W.

Modern-day textbooks are taking on a new look as well as some teachers discover the benefits of the “e-book.” An e-book is a publication that is tailored to the needs of a particular teacher, in which a teacher selects portions of available curriculum, orders them as suits the class, and has the online provider produce an online or printed version of the material for the students. E-books can result in far cheaper publications than traditional textbooks; they save schools money and only include information that will be used in the class.<sup>14</sup>

While the tools to transform classrooms are being developed daily, and well-heeled districts are already adopting them, there are many barriers to widespread tech integration. Funding for technology is only one of the many barriers to creating tech-savvy classrooms. One of the primary obstacles cited by researchers is resistance to change in school administration and culture.<sup>15</sup> Educators, already swamped with testing requirements and No Child Left Behind mandates, are sometimes reluctant to change what they know works. Learning new technologies takes time, resources and effort, and old methods are tried and true. Some teachers say a lack of training stands in their way of new technology adoption; some are unwilling to adopt a new tool without adequate training time.<sup>16</sup>

Past technology tools that teachers may have tried sit unused, collecting dust; without goals for implementation and outcomes, the incentive to integrate the tool in the classroom is missing. Such unfulfilled initiatives leave educators concerned by past waste of resources and make them less likely to embrace newly touted tools.

Additional obstacles to tech integration include the concern that Internet availability will be used inappropriately, such as for instant messaging and accessing adult content online.<sup>17</sup> The perception that digital tools like cell phones, email and the Internet are “weapons of mass distraction” keeps administrators from embracing the technologies.<sup>18</sup> Some charge that penmanship is becoming a lost art due to students’ reliance on digital keyboards.<sup>19</sup> Others say that time spent by young children at computer terminals is at the expense of child-centered activities; they should be outside digging in the sandbox and playing with other children and interacting with adults.<sup>20</sup>

Finally there is the argument that the American obsession with technology tools is misguided; American students are consistently outperformed by students from other

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<sup>14</sup> Amy Standen. Paperless Learning. Edutopia. Oct. 17, 2006. URL: [http://www.edutopia.org/php/article.php?id=Art\\_1672&key=137](http://www.edutopia.org/php/article.php?id=Art_1672&key=137)

<sup>15</sup> Prensky.

<sup>16</sup> Grace Rubenstein. The Rebirth of School. Edutopia. September 11, 2006. URL: [http://www.edutopia.org/php/article.php?id=Art\\_1656&key=137](http://www.edutopia.org/php/article.php?id=Art_1656&key=137)

<sup>17</sup> Cell Sanity.

<sup>18</sup> Josh McHugh. Synching up with the iKid. Edutopia. October 2005. URL: [http://www.edutopia.org/magazine/ed1article.php?id=Art\\_1355&issue=oct\\_05](http://www.edutopia.org/magazine/ed1article.php?id=Art_1355&issue=oct_05)

<sup>19</sup> Margaret Webb Pressler. Researchers See a Downside as Keyboards Replace Pens in Schools. Washington Post. October 11, 2006. Pg. A01.

<sup>20</sup> John Reinan. Plugged-in preschoolers: For better or for worse, kids love computers. Star Tribune. September 20, 2006, p. 1B.

nations, most notably in math and sciences.<sup>21</sup> Consider this comparison of American and Japanese teaching methods:

Curiously, Japan — the very symbol to many Americans of technological success... — has long practiced quite the opposite approach in its elementary schools. In science classes, for example, exercises typically begin with a simple question, followed by active exploration with basic materials: water, dirt, pendulums, and so forth. Rather than rushing from topic to topic, as most American schools do, Japanese students linger on individual problems, examining them from every angle, sometimes for weeks on end. Curiously, computers, Palm Pilots, and other fancy devices are rarely part of the picture. The emphasis, instead, is on the conversation — analysis, reflection, and aggressive argument, even with the teacher. Significantly, Japanese grade schoolers far outshine their American peers.

Technology detractors and stalwart school administrators may drag their heels and point to these arguments as reasons to sit out the technological revolution in schools. Yet there are many more reasons to embrace the digital tools that can simplify teachers' jobs, bring new tools to students, and embark on an invigorating education.

With some time spent working their way up the learning curve, teachers can indeed make digital tools work for them. Teachers can harness computers to grade online tests for them; automated grading spares them the late-night duty of marking the same mistakes on large stacks of papers.<sup>22</sup> Rather than banning the ubiquitous cell phones, teachers can incorporate them into class use. Says Pennsylvania State University's David Stong, "Cell phones are putting tremendous capabilities in many, many hands. Students can dial up music. Why not a homework assignment? A lecture? Notes on a painting they're looking at? Commentary on a film they're watching? If students can text message each other, why can't they text message a teacher during a field trip with their impressions?"<sup>23</sup>

Other schools have encouraged students to provide networking services for their school, saving the school time and money.<sup>24</sup> Students apply their computer skills to solve real networking problems, and educators have on-call experts to assist with digital glitches in short order. Other schools offer today's version of shop class in which students fix broken computers.<sup>25</sup> Disassembling computers, rebuilding circuit boards, and generating new software teach students how computers work. The refurbished computers can be put to immediate use in the school's classrooms; in Beverly, Ohio, the Fort Frye Local School District saved \$30,000 this way.<sup>26</sup>

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<sup>21</sup> Todd Oppenheimer. Tech made easy: It's not all about gadgets and gear. Edutopia. October 2005. URL: [http://www.edutopia.org/magazine/ed1article.php?id=Art\\_1360&issue=oct\\_05](http://www.edutopia.org/magazine/ed1article.php?id=Art_1360&issue=oct_05)

<sup>22</sup> Prensky.

<sup>23</sup> Cell sanity.

<sup>24</sup> John Blyler. Angels in the Network Architecture. Edutopia. June 2005. URL: [http://www.edutopia.org/magazine/ed1article.php?id=Art\\_1281&issue=jun\\_05](http://www.edutopia.org/magazine/ed1article.php?id=Art_1281&issue=jun_05)

<sup>25</sup> Oppenheimer.

<sup>26</sup> Ibid.



Proponents of digital classrooms say it is imperative to include students in the unfolding conversation about tech integration.<sup>27</sup> Students, after all, are the “digital natives,” whereas their teachers (and all older adults) are the “digital immigrants.”<sup>28</sup> In “Adopt and Adapt,” Prensky writes:

Having learned about digital technology later in life, digital immigrants retain their predigital “accents”— such as, thinking that virtual relationships (those that exist only online) are somehow less real or important than face-to-face ones. Such outmoded perspectives are serious barriers to our students’ twenty-first-century progress.

Future teachers, raised as digital natives, will be the ones who truly integrate technology in the classroom. Today’s educators must scramble to keep pace, and administrators must find the resources to invest in the most promising digital tools, notably laptops and interactive whiteboards. Nonetheless, some digital immigrants have learned to thrive in the high-tech environment and bring innovation to their classrooms. Consider these Minnesota examples of tech integration in the classroom:

- In September 2006 the White Bear Lake district opened Oneka Elementary, its first new school in almost 20 years. Oneka offers these technological features: digital whiteboards; technology to display content from a teacher’s computer; audio enhancements to project the teacher’s voice; carbon dioxide monitors that can boost class oxygen levels when needed to curb sleepiness; and over a dozen security cameras. The Spring Lake Park district is building a new school in Blaine that promises modern technological features as well.<sup>29</sup>
- The Stillwater Area Schools’ Oak-Land Junior High School and Stillwater Junior High School are a National Demonstration Site for one-to-one student laptop computing from 2003-2008. The Apple Computer initiative promotes wireless computing technology in high-performing schools. In addition to providing every staff member and student a laptop, the schools are purchasing additional tech tools like digital microscopes.<sup>30</sup>
- The Anoka-Hennepin Independent School District 11 was named one of the top 10 technology districts in the U.S. by *District Administration* magazine, a resource for K-12 education leaders. The 2002 award recognized the 13-town district’s ability to make the most of the resources at hand. Some of their accomplishments included creating a grading and reporting tool online that the district licenses to other districts; partnering with Atomic Learning to create around-the-clock professional development, and creating a statewide volume

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<sup>27</sup> Prensky.

<sup>28</sup> Ibid.

<sup>29</sup> Eric Hanson. First new school in years was designed to be worth the wait. *Star Tribune*. August 30, 2006, p. 1N.

<sup>30</sup> Making Connections web site. URL: [http://www.makingconnections.state.mn.us/tech\\_solutions.html](http://www.makingconnections.state.mn.us/tech_solutions.html)

discount purchase program that has allowed districts to save on their expenditures.<sup>31</sup>

- Riverview Magnet School, Anoka-Hennepin Independent School District 11's first magnet school, opened in fall 2003. Funded with federal desegregation money, each classroom features at least five networked computers, a laser printer, a digital video camera, a digital camera and a scanner. Teachers have laptops and personal digital assistants.<sup>32</sup>
- Mankato Area Schools have developed online resources so parents can access their child's grades, find teacher web sites and subscribe to district mailing lists. East Junior High School goes further by enabling parents to view their child's class assignments, test grades, projects and daily work.<sup>33</sup>
- Osseo Area Schools, District 279, offers online courses to Osseo students as well as eligible out-of-district students, such as private, other public and home-schooled students. Online classes broaden the course offerings available at any one school, and share the expertise of licensed Minnesota teachers from the Osseo schools.<sup>34</sup>
- Students in Cambridge, Isanti and Osseo witnessed open-heart surgery in real time using an Internet2 teleconference of a valve replacement in 2003. Students were able to interact with the surgical staff during the procedure. TIES and the University of Minnesota have partnered to bring new technology to Minnesota students.<sup>35</sup>

### **Planning for technology implementation in the schools**

All Minnesota school districts must develop a three-year technology plan in order to receive federal funding. The current plans cover years 2004-2007, and districts must develop new plans by spring 2007 to cover years 2008-2011. By completing a three-year plan, schools (and libraries) are eligible to receive E-rate discounts, No Child Left Behind Title II Part D funding, and Library Services and Technology Act (LSTA) funding. The tech plans highlight planned technology purchases, strategies for staff development, and goals for integration of technology into the curriculum.

IRP reviewed the Tech Plans of four school districts in the state: two urban, one suburban, and one rural Iron Range district. These places are different from one another on many levels; they vary in numbers of students in the district, racial and ethnic mix of the student population, rates of poverty in the district, and fiscal differences in the

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<sup>31</sup> The Top Ten Technology Districts. District Administration. URL: <http://districtadministration.ccsct.com/page.cfm?id=278>.

<sup>32</sup> <http://districtadministration.ccsct.com/page.cfm?id=278>.

<sup>33</sup> Making Connections web site. URL: [http://www.makingconnections.state.mn.us/tech\\_solutions.html](http://www.makingconnections.state.mn.us/tech_solutions.html).

<sup>34</sup> Making Connections web site. URL: <http://www.makingconnections.state.mn.us/integration.html>.

<sup>35</sup> Ibid.

communities that affect the districts' ability to provide technology in the schools. Cities and suburbs with a high tax base have the ability to raise more-than-adequate revenues to support the local schools. Places where housing values are lower and there is less of a commercial-industrial and office tax base struggle to provide the same level of funding for their schools. Funding for schools depends heavily on locally raised support, and places that have more to draw on are able to provide smaller student-teacher ratios, more extracurricular activities, and more technological resources that require significant upfront costs. Given Edina's strong tax capacity and reputation for strong public school quality, IRP included it in the mix between urban and rural places to see how the district would compare in its implementation of technology.

### **Technology in the St. Paul Public Schools (SPPS):<sup>36</sup>**

- The district hires Technology Integration Specialists to work with interested teachers to integrate technology into their classrooms. Building on the district's desire for "one-computer classrooms," participating teachers receive a laptop and LCD projector. They are required to check email daily, perform maintenance checks on computer equipment, attend training sessions like "Care and feeding of computer equipment," complete a year-end assessment, and share their achievements with other teachers. If they do not fulfill these requirements, the equipment will be taken away from their classrooms. The district offers ongoing monthly meetings for teachers and integration specialists to share ideas. Teachers are encouraged to share their tech-inspired lesson plans with other teachers in the district.
- The district offers Urban Planet software so teachers can create class web sites. Teachers need to know HTML to create their web site, and participation is completely voluntary. Schools are encouraged to have web sites; most though not all St. Paul schools have a school web site as of August 2006.
- Teachers can use the Blackboard On-Line Learning System to interact with their students. Blackboard provides online course management, content management, online collaboration, and communication. Teachers post assignment instructions or updates on Blackboard, and students can post questions for the teacher as well. The Blackboard service is available to all SPPS teachers for their existing courses.
- SPPS encourages use of Kidspiration (for grades K-5) and Inspiration (for grades 6-12), both visual learning software programs that provide teachers with ways to easily integrate visual learning. This software is often used as a pre-writing activity so that students can organize their essays visually on the computer with colorful bubbles and templates before they begin writing. Additionally, many classrooms develop iMovies and podcasts.

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<sup>36</sup> Technology features of the St. Paul Public Schools were gathered from the St. Paul 2004-2007 Technology Plan, as well as an interview by Kate Flynn with Connie Feil, Director, Department of Educational Technology, and Sheldon Ramnarine, Assistant Director, Dept. of Educational Technology.

- Each year, SPPS hosts a Student Technology Showcase, in which students demonstrate how technology has helped them learn their schoolwork. The 2006 showcase featured students from 30 different schools and 60 curriculum-based technology projects. Included in the showcase was the Student Film Festival, along with a Showcase Crossword Puzzle.
- In terms of online course offerings, SPPS only offers its health class online because many students have trouble fitting the course into their schedule. Pursuant to Minnesota state law, students can take any classes online which are not available at their own schools, but which are available at other Minnesota schools. While that requirement remains uniform across the state, each district can choose to develop its own online course infrastructure.
- SPPS provides teachers with a subscription to Atomic Learning. Atomic Learning provides teachers with “just in time” tutorials about computer applications. Teachers can learn how to create a podcast for an upcoming class, for instance, and can do so on their own schedule.
- SPPS provides a parent portal where parents can view grades, attendance records, class schedules, overdue library books, lunch balances, and discipline records. Current grades are available to parents as soon as the teacher updates the grades online.
- Almost all SPPS schools have wireless networks, although each *entire* school building is usually not wireless. All of the classrooms have access to the Internet, but not all classroom computers will be connected to the Internet; a teacher may choose not to connect a classroom computer to the Internet to ensure a computer is used for a specific program, or to keep the students off the Internet. A lack of power, rather than Internet access, is the culprit in some of the older school facilities where power access is insufficient to support computer networks.
- Almost all of the St. Paul schools have at least one laptop cart, with about 15 laptops per cart. Teachers can check out the carts to bring laptops to their classes. Students as young as kindergarteners use laptops.
- SPPS has received Microsoft settlement vouchers, which it uses for software and hardware. In 2006, the state of Minnesota reached a settlement with Microsoft Corporation over a 2004 antitrust lawsuit. Minnesota distributed \$55 million in settlement vouchers to school districts, which can be used to purchase hardware and software. The amount of vouchers each district receives depends on the concentration of poverty within the district. This means that some schools will only receive a few thousand dollars, whereas SPPS and MPS received around \$6 million each. The districts have until 2012 to use the vouchers.
- A current budget crunch means SPPS is currently losing many media specialists. Each high school has retained one media specialist. For grades K-8, some schools

have media specialists, others have part-time specialists, and some rely on volunteer media specialists.

### **Technology in the Minneapolis Public Schools (MPS):<sup>37</sup>**

- Individual efforts by teachers include the use of blogs to communicate with their classes; MPS teachers routinely use podcasts and videos from the Internet to teach their classes; some students receive world language training on ipods. One 8<sup>th</sup> Grade English teacher used the video game Sonic the Hedgehog to teach *The Iliad*.<sup>38</sup>
- The district is buying a computer program to help students track their college applications. The program provides students and counselors with information about how many MPS students have been accepted at various colleges, what their entrance scores were, and the amount of scholarships they received. The program will not only aid students in their college admissions but help the district track college acceptance rates. The program dovetails well with Achieve!Minneapolis, a program launched by MPS and community organizations to help students prepare for college or the workplace.
- MPS also maintains an eMentor portal, which enables over 1,400 MPS students to connect online with business and professional mentors in the community. The students maintain weekly communications and have occasional supervised visits with their mentors.
- In a localized effort, the Minnesota Timberwolves' Kevin Garnett donated a technology center at Washburn High School. Students using the center have access to online mentors, scholarship and internship opportunities, and college search tools.
- MPS subscribes to Urban Planet where teachers can create their own web sites if they so choose.
- Students must complete a major technology-enhanced project each year. Their work is then showcased on the Minnesota State electronic portfolio system called Efolio.
- MPS students, staff, and parents use a special search engine called NetTrekker. NetTrekker provides online resources organized by grade level, along with resources tailored for gifted students, ESL students, or students with special needs.

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<sup>37</sup> Technology features of the Minneapolis Schools were gathered from the Minneapolis 2004-2007 Technology Plan, as well as an interview by Kate Flynn with Coleen Kosloski, MPS Executive Director of Technology.

<sup>38</sup> WCCO aired a news report on the teacher's use of Sonic the Hedgehog in the classroom. It can be viewed at URL: <http://wcco.com/video/?id=17627@wcco.dayport.com>.

- MPS offers extensive online courses, including algebra, English, chemistry, history, art history, forensic science, German, and Spanish. Online courses extend school offerings if certain classes are cut from the standard curriculum. MPS online courses are not entirely online; they sometimes require group projects or fieldtrips. Teachers provide lessons, create digital drop boxes, post assignments, provide assessments, and engage students in online discussions. Online students complete a digital online portfolio to present their coursework. Online courses offer the flexibility to meet a student's crammed schedule; students can work at their own pace, whether that requires more time or is accelerated to graduate with their class or fulfill missing requirements. They also offer home-schooled students in-depth subjects they might not otherwise receive.
- MPS teachers are required to undergo technology training, as stated in their contracts: "district and staff will be expected to know, understand, and use these systems and technologies for communication purposes and to advance student and staff learning." Teachers are required to provide electronic record keeping. MPS created an intranet system accessible from all locations so teachers can record attendance, progress reports, and quarterly grades in Discovery Classroom Plus.
- MPS provides a "June Technology Academy" for educators with over 40 tech class offerings like Excel, MS Word, and PowerPoint, as well as classes on web site development, podcasts, iMovies, and digital photography. MPS also uses Atomic Learning to provide "just in time" technology training to teachers, students, and parents.
- Media specialist applicants are interviewed not only by the district technology department but with the individual school as well to ensure a good fit at the particular school. Media specialists and computer teachers participate in monthly training programs called Livewires and Curriculum Connect. The media staff also has an intranet system to share their lesson plans.
- MPS provides a program called Destination 2010, in which MPS students graduating in 2010 receive computers for use in their homes. Participating students learn how to assemble their computers and maintain them with virus protection software. Students also learn computer basics, Microsoft Office applications, and how to use their student email accounts. Additionally, Time Warner is offering a year's free service of Road Runner to Destination 2010 families.
- Like SPPS, MPS also received a large Microsoft settlement, around \$6 million. This money comes in the form of vouchers, which the district can use to spend on new computer hardware and software.

### Technology in the Edina Public Schools:<sup>39</sup>

- Edina employs Technology Integration Specialists to work with teachers to promote information literacy and integrated technology. The Plan's goal was to retain three Technology Integration Specialists who would provide staff development workshops before and after school.
- According to the Plan, all elementary and secondary staff members are *required* to have a web site for their classes or grade level.
- The Tech Plan places a great emphasis on virtual reality instruction. Edina uses a system called Edina Interactive Television, or "eITV." Edina has installed mobile video conferencing systems and interactive TV systems into each elementary and secondary school in the district. Using this equipment, students and staff can attend classes, listen to guest author presentations, go on electronic field trips, and participate in training sessions at distant locations. EITV provides full-motion, full-color video with synchronized audio communication between the instructor and student.
- For the past three years, Edina District Media and Technology Services hosted a Technology Fair for K-5 classes. In 2006, over 120 projects were submitted within three different categories: Digital Art, Video Editing Movie Making, and Technology Integration Projects. Winning projects will be submitted to the state competition in fall 2006.
- Edina maintains a Staff Development Center which contains video conferencing and distance learning technology to promote teacher development.
- All Edina teachers and administrators are required to develop and complete a Technology Professional Growth Target each year, with goals that meet or exceed the National Educational Technology Standards (NETS).
- Edina high school teachers use a system called "Edline" to provides parents and students with grades, assignments, and links to curriculum. The Tech Plan recommended that by the 2005-2006 school year, elementary school teachers communicate with parents through an online cumulative folder for each student.
- When the Tech Plan was written, 100 percent of Edina classrooms and offices had Internet access. In 2002, Edina had a 4:1 ratio of students to instructional computers. Edina hoped for a 1:1 ratio of students-to-computers at the secondary level when it wrote its current Tech Plan (progress toward this goal is not confirmed). In 2002, 100 percent of Edina schools and departments had their own web sites.

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<sup>39</sup> Technology features of the Edina Public Schools were gathered from the Edina 2004-2007 Technology Plan. IRP's requests for an interview with a member of the Edina technology team were not returned.

- In its Tech Plan Edina states it will recycle older computers and provide them to Choice Is Yours students for home use.
- Rather than relying on self-assessment, Edina uses the enGauge Survey to assess how successful its technology implementation has been. The enGauge Survey is designed by the North Central Regional Education Laboratory (NCREL).

#### **Technology in the Greenway Public School District:<sup>40</sup>**

- In some classrooms, the district makes use of “Smart boards,” interactive whiteboards connected to a classroom computer than can be controlled by finger touch.
- Teacher participation in technology training and/or instructional implementation is voluntary. The Tech Plan proposed after-school computer “mini-classes” for teachers on topics such as web site development and online quiz creation.
- An Internet search of Greenway school web sites revealed one class with its own web site (a first-grade class at Vandyke Elementary).
- According to its Tech Plan, the district intended to completely automate their library system. All individual school web sites have links for online library catalogs. The Greenway High School Media Center web site has many electronic links and resources that can be used from off-site with access codes.
- The Tech Plan states the district’s intention to create an online parent portal to facilitate communication between educators and parents.
- GPS maintains an eight-district alliance (Quad County Projects) through which it receives high-speed telecommunications access. All schools within the district and the district office are connected to the Internet via this network. All classrooms within the district have at least one Internet-connected computer available for teacher and student use. Each school also has at least one computer lab with a minimum of 18 computers. Classrooms have multiple phone and data ports, a television, and several are equipped with digital whiteboards.
- Greenway High School has two different computer labs, one exclusively for teacher instructional use. In addition, the high school has a small writing lab (12 computers) as well as a media center with 30 computers, a research writing lab, LCD projector and whiteboard. Connor-Jasper Middle School also has a separate media center (12 computers) in addition to its main computer lab.

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<sup>40</sup> Technology features of the Greenway Public Schools were gathered from the Greenway 2004-2007 Technology Plan. IRP’s requests for an interview with a member of the Greenway technology team were not returned.



- The Greenway plan also discusses an “Open Lab” initiative. Under this plan, school labs would be open before and after school for student, staff and community member use. Lab computers would also be available for community education technology classes.
- The Tech Plan proposes the creation of a secure digital file management process (student records, business office documents) for administrators, student identification and management systems, and a handheld initiative for administrators (for person-to-person communication and interfacing with the student management system).
- Greenway has used the enGauge framework to assess their integration of technology, as well as TAGLIT (Taking a Good Look at Instructional Technology) online assessment tools. In their 2004-2007 Tech Plan, Greenway acknowledges that they were in “the adoption stage” of technology use at the time of formulating their technology plan, and a goal for the plan was to “significantly increase the integration of technology throughout (their) curriculum.”

### **Summary of findings**

Each of the four technology plans reviewed for this report contain at least some elements of outstanding tech integration, and at least three of them show room for improvement. Edina stands out as providing the most relevant content for students and parents by requiring all teachers to create class web pages. None of the other surveyed districts require this, though Minneapolis has the next highest rate of web site creation by teachers. St. Paul lags seriously behind given that some of its public schools do not even have their own web site yet. Parent portals are available in all of the districts except Greenway. Whiteboards are most notable in Edina and Greenway and are not highlighted in the Minneapolis and St. Paul plans. Edina aims to have one-on-one computing (one laptop per student), one of the key components of tech integration.

Since Edina is a community with a relatively high tax base and low poverty rate in the city and school district, it only makes sense that its school district would be at the forefront of tech integration. With its resources and its moderately-sized enrollment (compared to Minneapolis and St. Paul), the district can move toward the goal of one laptop per secondary student with a speed that other districts can’t match. When the pupils’ families are of higher income, they are more likely to have computers at home and to have strong parental involvement in their schooling. These factors put further pressure on the school district to deliver a tech-rich environment.

Funding isn’t always the leading factor in variations in tech integration; school districts with higher rates of student poverty and lower family incomes — like Minneapolis and St. Paul — are more likely than affluent suburbs to receive grants from the Bill and Melinda Gates Foundation and other charitable sources. But funding alone does not create a culture conducive to technology. It must come from the leadership in the district and individual schools. A tech-oriented district culture will ensure that teachers make use

of computers, at least to aid in their teaching, and will result in more web sites devoted to individual classrooms. St. Paul's plan to remove laptops and projectors from teachers who do not fulfill requirements signifies a less-than-warm embrace of technology. St. Paul and Minneapolis diverge in their approach to tech integration, in spite of each being central cities with large enrollments and higher levels of poverty than seen in other parts of the metro region and state.

Integration of technology in the classroom varies widely across the state's communities and is affected by student poverty rates, budget constraints and school district will. Minnesota educators would be well served by cross-district conversations to analyze the most effective tech tools in peer districts. Successful integration relies on the willingness of teachers and administrators to embrace change, devote precious resources to tech tools and staff development, and make smart and lasting choices among competing digital innovations.

# 4

## LIBRARIES

How Public Libraries "Reach the Unreached"



*Inver Glen Library, Inver Grove Heights*

## 4. LIBRARIES: How Public Libraries “Reach the Unreached”

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### The role of public libraries in connecting those with limited access to technology

Beyond providing information resources, public libraries provide public access to computers and the Internet for people who might not otherwise have it. While many people already have access to computers and the Internet at work or home, many people do not; they may work in a non-wired environment, not own a computer, or live in an area not well served by broadband, such as in a rural area. In urban areas people have numerous places to go for public computer access, such as nonprofit community technology centers or public libraries; in more geographically remote areas, libraries are often the only place to go to access a computer, send an email or do a search on the Internet.

Across the United States, public libraries provide their communities with critical public computer and Internet access. According to a September 2006 library and Internet usage report:

- 98.9 percent of public library branches are connected to the Internet.
- 98.4 percent of connected public library branches offer public Internet access.
- 36.7 percent of public library branches offer wireless Internet access, up from 17.9 percent in 2004.
- 100 percent of high poverty branches—those with greater than 40 percent poverty in the service area—are connected to the Internet and offer public Internet access.
- Public library branches have an average of 10.7 public access computers, with rural libraries having an average of 7.1 workstations and urban libraries having an average of 17.9 workstations.<sup>1</sup>

Public libraries are well positioned to be the places that provide the link to computers and the Internet for those who don’t otherwise have adequate access. They are designed to be open and accessible to all residents; they are community-based with a long-standing history of offering lifelong educational opportunities at no cost, and they are structured by law to cover 97 percent of the nation’s population.<sup>2</sup>

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<sup>1</sup> John Carlo Bertot, et al. “Public Libraries and the Internet 2006: Study Results and Findings: Libraries as Community Public Access Computing and Internet Access Points,” Information Use Management and Policy Institute at the College of Information, Florida State University, September 2006, p. 1.

<sup>2</sup> The Bill and Melinda Gates Foundation. “Towards Equality of Access: The Role of Public Libraries in Addressing the Digital Divide.” February 2004, p.12.  
<http://www.gatesfoundation.org/nr/Downloads/libraries/uslibraries/reports/TowardEqualityofAccess.pdf>.

Who is using the computers in public libraries across the country? Several research groups have posed this question in their research. As of 2004, the Bill and Melinda Gates Foundation reported that more than 14 million Americans (about 10 percent of all Internet users) regularly use the computers available in public libraries.<sup>3</sup> Their source for this figure is the U.S. Department of Commerce 2002 report, “A Nation Online: How Americans Are Expanding Their Use of the Internet,” which surveys 14 million users over the course of a year.

A report from the Pew Internet and American Life Project in 2004 finds that “on any given day more than 4 million Americans are accessing the Internet from some place other than home or work.”<sup>4</sup> The authors break down this group of online users further; they find that some people are accessing the Internet wherever they are, suggesting they carry laptops that rely on wireless signals or go to hotspots where they can access the Internet, such as online cafes. This group is young and highly connected; more than half the people accessing the Internet from a “third place” [beyond work or home] are between the ages of 18-24, and almost half of the students report accessing the Internet from a “third place.”<sup>5</sup>

But of greater interest to this report is another camp of users accessing computers neither at work nor home; this group is “relatively poor and does not have high levels of education. Many have access at work, some have access at home, and a portion of them depend on a place other than home or work for their Internet access. Those who depend on ‘third places’ make up only 3% of the entire U.S. Internet population, but they are disproportionately likely to live in households earning less than \$30,000, to live in rural areas, and to be newcomers to the online world. They are fairly infrequent users of the Internet who often use libraries and friends’ homes as their access points.”<sup>6</sup>

The Gates Foundation works with the Pew Internet and American Life Project to hone the figures on computer usage at public libraries. The Gates Foundation finds that while patrons from all economic and racial backgrounds use public library computers, certain traditionally disadvantaged groups rely more on them.

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<sup>3</sup> “Towards Equality of Access: The Role of Public Libraries in Addressing the Digital Divide,” p. 6.

<sup>4</sup> “People who use the Internet away from home and work,” memo by Paul Harwood and Lee Rainie. Pew Internet and American Life Project, March 2004.

<sup>5</sup> Harwood and Rainie.

<sup>6</sup> Harwood and Rainie.

Figures 15 and 16 show the following:<sup>7</sup>

- African Americans (18.7 percent) and Hispanics (13.8 percent) use public library computers more than whites (8.6 percent);
- Among library users African Americans and Hispanics rely exclusively on the library computer for Internet access more often than their white and Asian counterparts.

The Gates Foundation report also notes that Native Americans rely more than all other groups on library computers and are nearly three times more likely to use them than whites.<sup>8</sup>

Figure 15

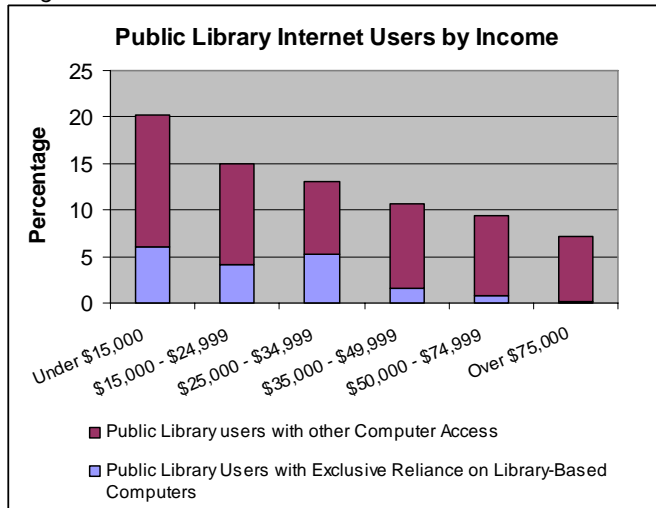
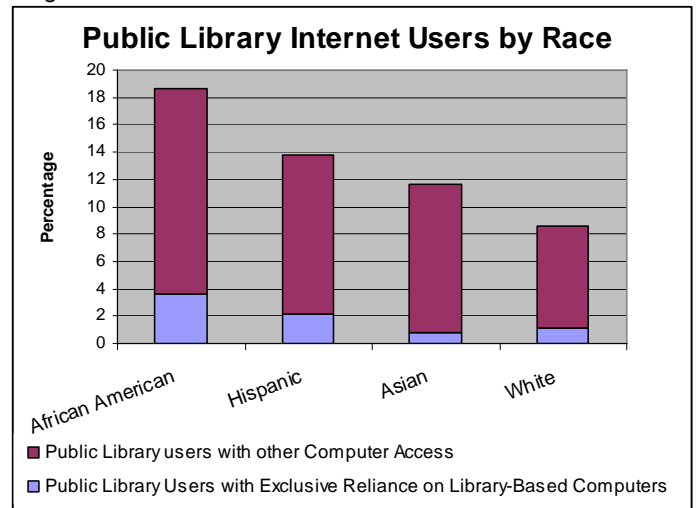


Figure 16



Similar and predictable patterns are seen among individuals at different income levels. The Gates Foundation reports similar findings based on income:

- Lower-income users are more likely to rely, often exclusively, on public library computers for Internet access than those with higher incomes.
- Individuals at the lowest income levels (under \$15,000) tend to be more reliant on library computers than those at the highest levels (over \$75,000) by a factor of two to three times.<sup>9</sup>

These figures support the anecdotal evidence that public libraries are pivotal in linking patrons from traditionally disadvantaged groups with computer access, skills and resources, for those who desire to get online.

<sup>7</sup> Charts above are from “Towards Equality of Access: The Role of Public Libraries in Addressing the Digital Divide,” p. 18, which cites the following source for the data in both charts: U.S. Department of Commerce, 2002. A Nation Online: How Americans Are Expanding Their Use of the Internet.”

<sup>8</sup> “Towards Equality of Access: The Role of Public Libraries in Addressing the Digital Divide,” p. 19-20.

<sup>9</sup> Ibid,” p. 20.

## Defining success for wired public libraries

The September 2006 report, “Public Libraries and the Internet 2006: Study Results and Findings: Libraries as Community Public Access Computing and Internet Access Points,” provides some clear guidelines as to what constitutes success for public libraries in the technology age. They use the moniker “successfully networked public library” to describe those libraries that achieve the high standards tech-savvy patrons require. The report describes the standard successfully networked public libraries must meet:<sup>10</sup>

- They must provide high quality traditional library services as well as networked services. (Networked services include electronic information resources and/or services, such as Internet access, email, chat, online reference, subscription databases, and other web-based services. The “network” refers to the services offered within the library as well as the library’s virtual branch, meaning web-based external services).
- They have exceptionally high quality leaders who successfully and actively engage the political process.
- They offer public access copiers, fax, printers, scanners, and computing workstations, and may also lend a variety of equipment including digital cameras, GPS equipment, ipods, MP3 players, and even telescopes.
- They offer an online public access catalog of library materials.
- They have sufficient bandwidth to meet the needs of patrons and staff and offer or plan to offer wireless connectivity. They also anticipate a future need for additional bandwidth as video, music, and large file transfers become more common.
- They generally have enough public workstations but cannot meet peak demand.

The report authors provide many further details on IT support, training, capacity and more to aid libraries in their quest to best serve their patrons with today’s technology. The catch is that providing these networking resources requires substantial funding; libraries rely on government support as well as assistance from private foundations, such as the Melinda and Bill Gates Foundation, to bring their libraries up to speed.

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<sup>10</sup> The following bullets are cited from Bertot, pp. 3-5.

## Case Study: How the Brookdale Library serves its diverse and changing community

The Hennepin County Library system has been recognized as one of the top ten performing library systems in the nation among libraries of its size.<sup>11</sup> The Brookdale Library is one of the stars in the Hennepin County Library system.

The Hennepin County Library system has approximately 1000 computers spread across its 26 branch libraries (an average of 38 computers per library). The Brookdale Library, located in Brooklyn Center, has 134 computer workstations and 20 Word processing workstations. The branch underwent a major renovation and expansion in May 2004 with extensive input from the community. The extensive computer networking at the Brookdale site is just one of many ways this branch has been retooled to meet the needs of its patrons.

The Brooklyn Center population is quite diverse; in fact, the Brookdale Library serves the most diverse population of all the Hennepin County libraries.<sup>12</sup> According to the 2000 Census, about 14 percent of Brooklyn Park's residents are black, either of recent African immigrants or African American, about 9 percent are Asian, with the majority of them being Hmong, and nearly 4 percent of the residents are Hispanic. Those percentages are higher now, seven years after the Census was taken. According to the Hennepin County Library's Michael McConnell, the area's African immigrants include people from Liberia, Somalia, Ethiopia; the Asian immigrants are largely Hmong, and the city has a growing Hispanic community as well. Because of the large number of immigrants in the community and accessing the library, the staff found that the branch was not able to fully meet their patrons' needs.

Hennepin County officials recognized that the Brookdale library needed an overhaul, and they initiated an involved process to get community input. They wanted to move away from the library model of the past, which relied on esoteric library jargon that alienated its patrons. Since the earlier branch design didn't seem to meet the needs of the community, the library officials actively designed the library to be flexible as demographics of the area changed. Library officials knew they would have to offer more programming in the languages of the people they serve, which meant offerings in 10 different languages.

"Our focus was to remove barriers, ease access to resources, and encourage the development of self-reliant users," Michael McConnell, Hennepin's coordinating librarian for public services, told a *Library Journal* reporter.<sup>13</sup> "When patrons came in here they were unsure and uncomfortable. Something totally different had to be done."

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<sup>11</sup> See Hennen's American Public Library Ratings (HAPLR), available online at [www.haplr-index.com/HAPLR100.htm](http://www.haplr-index.com/HAPLR100.htm). The Hennepin County Library has been ranked among the top 10 libraries in the largest population category since at least 1999. According to the Hennen Report, of the library systems serving a population of at least 500,000, Hennepin County is ranked sixth in the nation. The measurements are on traditional library resources however, and do not yet include technology measures

<sup>12</sup> Statement made by Michael McConnell of the Hennepin County Public Library in a phone call with IRP staff member Jill Mazullo.

<sup>13</sup> "Power Users—Library Buildings 2005" by Beth Dempsey, December 15, 2005, *Library Journal*.



The way the library had been organized was not working well for the library's patrons, due to cultural and language barriers. Some streamlining was in order.

The library officials met with local residents, community groups and staff from the City of Brooklyn Center to decide how best to design the new library. The community expressed a strong desire for a more focused approach to library content. The library simplified its inventory, removing half of its less useful materials and enhancing areas that community members said they wanted. The library took a lead from today's successful bookstores and organized books and materials in ways that are more intuitive to users. This resulted in "information neighborhoods" such as help with homework, technology, small business, careers, automotive, recreational reading and a few other topics. Using well-marked signs for each "neighborhood" and carpeting leading to each area, patrons find the information they seek more readily than they did in the past.

In addition to dividing its materials into neighborhoods, Brookdale has grouped its 135 computers into different neighborhoods as well. The groups are determined by the types of programs or links that are available on the computers. Computers in the same neighborhood are physically grouped together and large signs indicate the topic areas. The primary signs are Health and Fitness, Automotive, TeenLinks, KidLinks (for elementary students), LittleLinks (for preschoolers), World Language, Home Improvement, Audio/Video, Business and Jobs.

The Automotive neighborhood is "hugely popular" according to Elizabeth Feinberg, principal manager of the library.<sup>14</sup> The section's popularity could be because many Brooklyn Center residents cannot afford to take their cars to a repair shop, so they seek information on how to fix the cars themselves. When a patron uses a computer in the Automotive neighborhood, the computers default to an auto-related homepage. As McConnell told the *Library Journal*, "We don't make people click through layers and layers to get what they want," says McConnell. "We simplify every element."

The computers in the information neighborhoods geared toward children have Internet filters in place to shield children from inappropriate content. Like the Automotive computers, the child-centered computers default to home pages of great interest to children. In the World Language neighborhood, the home pages are in various languages like Vietnamese or Somali. The World Language neighborhood is particularly helpful for immigrants seeking a wide variety of online resources. The librarian who most frequently works in the World Languages neighborhood is Somali and is knowledgeable about immigration and the path to U.S. citizenship. As a result, he provides a rich resource for the immigrant patrons.

The computers in the Jobs neighborhood are almost always in use. Patrons can use the job computers for two hours or longer if no one is waiting (all other library computers are available for one hour at a time). This neighborhood also contains an entire section of reading material and bulletin boards to help patrons with job questions. For example,

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<sup>14</sup> IRP graduate assistant Katherine Flynn interviewed Elizabeth Feinberg on-site at the Brookdale Library in July 2006.

there is a bulletin board with postings about resume tips and interview skills. There are several bookshelves with books about job searches, e-resumes, the MN Workforce Center, interview strategies, and more. There are niche books for specific communities, such as “Job Search Guide for Latinos.” In the same area, there’s information about federal student aid applications, and how to get free online help for the SAT and ACT (college entrance exams), the TOEFL (Test of English as a Foreign Language), and civil service, law enforcement, postal services, and emergency medical services applications. Similarly, there is a bookcase devoted solely to college preparation books near the job computers. Of all the information areas in the library, the Jobs neighborhood is by far the largest.

The Jobs neighborhood is not the only career resource that Brookdale offers its patrons. During the summer of 2006, Brookdale opened its doors to a job counselor from the HIRED Dislocated Worker Program, a nonprofit organization which helps adults and youths acquire job-search skills. This is a collaboration between the Hennepin County Library and the Hennepin County Workforce Center. Minnesota’s Dislocated Worker Program serves people who have lost their job through no fault of their own. The program’s goal is to help individuals transition into suitable jobs with wages comparable to their previous position.

Brookdale library offers free wireless access throughout the entire building, which is helpful for patrons who own laptops, and offer scanners at some of the computer stations. While patrons can use some of the computers to play games, other computers are designated as a “no-game zone.” Brookdale Library also offers numerous meeting and study rooms.

Patrons can sign up for the type of computer they want to use (e.g., one for jobs or automotives). Once their turn comes, the patron’s name appears on the monitor. Users sign up at one of three different sign-up stations:

- Internet: Patrons who sign up for these computers can use the Internet, complete online research, use the library catalogue, email, etc.
- Computer Lab and Job and Career: Patrons who sign up for these computers can use software for writing resumes, reports, or spreadsheets. They can also use the computers for scanning, PowerPoint presentations, and Internet access.
- KidLinks and TeenLinks: Patrons who sign up for these computers can use the Internet and software for writing reports.

One of the library’s concerns was that more patrons be able to access more information more readily, without getting frustrated along the way and possibly giving up their search. Brookdale offers a training sequence for patrons who wish to make the most of their library. In order to have technological literacy, one first needs have language literacy.

The library offers basic computer training classes for people who are interested, and recognizing the language barriers people face, the library offers the classes in many languages other than English. Following the sequence of skills, patrons can then enroll in the “Using Library Resources” classes, which are only offered in English. For people who struggle with English, there are conversational circles held at the library where people can practice their English skills. Once patrons feel comfortable enough in English, they can take the library resources class to learn to use the full tools of the library. Thus the library is linking English literacy skills with access to technology resource tools, and helping their patrons with both through no-cost programming.

The Hennepin County Library offers an extensive array of classes. Class enrollment begins six weeks before each class, and the classes tend to fill up immediately. Once enrollment for a class is full, the library starts a waiting list. According to Feinberg, there is strong demand for the classes, but funding barriers keep the libraries from holding more. There are also time constraints which prevent the library from offering more classes. Because the classes require preparation time, the classes use valuable computer time and space before, during, and after the actual classes. This time commitment renders a significant number of computers unusable to the rest of the public for hours at a time. Because open computer access is a vital component of the Brookdale Library, the time problem serves as a significant deterrent from holding classes. To better accommodate the classes without interfering with the accessibility of the computers, the library holds most classes on Saturday mornings when usage is slower.

The Hennepin County Library system offers the following classes across its 26 branches:

- Learn to Mouse and Keyboard
- Senior Surf Days
- Introduction to Computer Software
- Internet Lab
- Yahoo! Email Basics
- Internet Basics
- Libraries, Computers & Digital Information
- Online Catalog: Quick Class
- Advanced Yahoo! Email
- Advanced Internet Searching
- Business Leads Using Reference USA: Quick Class
- Genealogy Research Using Census Records
- 406 Genealogy Research Using Immigration Records
- Genealogy Research Using Vital Records
- Genealogy Resources
- Genealogy Resources: Demonstration
- Health Information: How to Find It, How to Use It
- Job Searching: Quick Class
- Language Learning Using Rosetta Stone: Quick Class

Some of these classes have prerequisite classes that patrons must take before enrolling. Some classes are offered more frequently than others. Each branch offers a selection of the classes based upon interest level in each location.

Hennepin County Library computers also offer interactive tutorials, which allow users to improve their computer skills without an instructor and at their own pace. There are tutorials which teach patrons to type, use a mouse, and locate magazine and newspaper

articles in the library. Some of these tutorials are available online so patrons with home computers can access them at anytime.

One thing the library does not offer is specialized computer training, such as how to use common software or the Microsoft Office suite of applications. Library officials say those classes are already available through community education, and that is the appropriate place for such classes to be housed. Offering them at the library would be a duplication of effort.

The library has a separate computer lab that accommodates 33. The computer lab is staffed much of the time, and librarians are available to answer computer questions. However, patrons possess a wide variety of computer knowledge, and sometimes a handful of patrons with little computer experience can tie up numerous staff members at a time. While some patrons may be fairly skilled with the computers, other patrons are still learning how to manipulate a mouse. Because it can take a long time to help patrons with very little computer experience, there are not always enough librarians to help all of the patrons needing assistance. But from Feinberg's perspective, once librarians assist a new computer user, that individual is building a foundation of computer skills. For example, if a librarian helps a patron set up an email account on one visit, that patron probably won't need the same level of attention from staff the next time around. New computer users thus become more computer literate with every visit.

Brookdale Library is much noisier than the traditional library, but the library openly embraces the noise. According to Feinberg, today's modern library is no longer about being silent. Instead, the modern library is a community-oriented center where patrons are welcome to engage in conversation. Some patrons, particularly senior citizens, have been resistant to the noise level at Brookdale, but most patrons have become accustomed to it. Feinberg also noted that patrons who prefer a quieter library experience can come at the less-trafficked times.

Brookdale Library is holistic in its approach to the delivery of services, and integrates technology throughout the fabric of the library community. The branch manages to meet the needs of a diverse and changing population, providing the resources and information they want in a 21<sup>st</sup> century way: by using technology to help traditionally disadvantaged patrons access life opportunities like job attainment, self-help and even citizenship. "A one-stop shop with everything you might need is a real service enhancement and a much easier learning experience for the less-skilled user," says McConnell. "It engenders self-reliance, self-confidence, and a greater chance of long-term success in using libraries."

# 5

## CITIES

### Community Benefits in the Wireless Minneapolis Initiative



*PPL Learning Center, Minneapolis*

## 5. CITIES: Community Benefits in the Wireless Minneapolis Initiative

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When the terrorist attacks occurred on September 11, 2001 at the World Trade Center, police, fire and other emergency responders had to quickly assess the situation. Planes had crashed into the Twin Towers, thousands of people were in the buildings, and there was uncertainty as to the stability of the skyscrapers. Choppers in the air could see damage that was not apparent to those scrambling on the ground. Without the ability to set up an instant communications network for all of the emergency responders, there was no way to share information rapidly enough to coordinate an optimal response. Because of these communication failures, the towers were not fully evacuated in time and many WTC workers, emergency personnel and their vehicles and equipment were decimated when the towers fell. The catastrophic events initiated by terrorists were compounded by our own failures to adequately communicate during the emergency response to the attacks.

In the five years that have passed since the terrorist attacks of 9/11, many U.S. cities have launched technology initiatives to create sophisticated communications networks in the immediate vicinity of any emergency within their city's limits. A fire in a downtown office building would draw fire, ambulance and police personnel. If a wireless network were in place, the first responders could quickly establish a local communications umbrella to allow the emergency personnel to make best use of intelligence and share new information, leading to improved public safety and better outcomes. This network could be tapped for routine service calls, small emergencies and even terrorist threats. Having seen the devastating effects of not being technologically prepared, other cities vowed to avoid the mistakes that mired the New York City response.

Thus began a massive push to build broadband or wireless initiatives in U.S. cities. According to a September 2006 report from Muniwireless.com, an industry group that tracks municipal broadband initiatives, sixty-eight U.S. cities and counties have already built city or countywide wireless broadband networks in operation for public access and municipal use, including Tempe AZ; Anaheim CA; Lexington KY; and Buffalo, Chaska and Moorhead MN.<sup>1</sup> In addition, Muniwireless.com counts the following initiatives in the U.S.:

1. city hotzones (43);
2. city or county networks for municipal use only (35);
3. planned deployments, e.g. where an RFI or RFP has been issued or where a network is being deployed (135);
4. cities and counties that are seriously considering wide-area networks (25).<sup>2</sup>

The City of Minneapolis is one of the 135 "planned deployments." Minneapolis, like many other cities, decided it should develop a network first and foremost for public

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<sup>1</sup> <http://muniwireless.com/municipal/1359>

<sup>2</sup> Ibid.

safety, but that the network could also be an amenity to city residents and its business community. But what might that amenity look like?

As described by Jim Farstad, program manager for the City of Minneapolis Wireless initiative, his first question when the city project was started in early 2004 was “the city will build a wireless network for the purpose of what?”<sup>3</sup> He and Bill Beck, Minneapolis Deputy CIO, had some general answers to that question, but struggled to move beyond vague responses, even from proponents of the project. The public safety rationale for the network was obvious. But there would be the potential to offer reduced price wireless Internet access to Minneapolis residents, businesses and visitors once the network was built, since the entire city would essentially be a “hot zone.” This means an out-of-town visitor arriving at the airport could log onto the wireless network upon landing, and receive a continuous signal on the Hiawatha light-rail line and in their downtown hotel or office meeting.

The potential for the network was enormous, but the city officials realized that even at a reduced cost, not all residents would take advantage of the wireless amenity. Farstad and Beck were aware of the general concept of a “digital divide” but did not have good data on what that meant in the city of Minneapolis. Early on they worked with the Minneapolis School District to create GIS maps of the district’s bus pickup routes to determine where the ESL (English as a Second Language) students lived. This exercise gave city staff a better handle on the neighborhood racial and ethnic demographics, if the digital divide can be boiled down to a lack of access to technology for nonnative English speakers.

The city also assembled five working groups to discuss the wireless concept to better understand how different industry sectors might tap the network. The working groups included the following constituencies: public safety; institutional services; library, park and city boards; an external advisory group for entertainment, Metropolitan Airports Commission, University of Minnesota, and the business community; and a business, finance and franchise working group. Initially the city didn’t approach the public citizenry to solicit their input on a citywide network; city officials wanted to first determine how they would finance such a network before taking it public.

As Farstad tells it, the Minneapolis City Council was very supportive of a wireless network from the start, but asked that the city pursue it “without spending a dime.” Without secure financial backing, the city could not plan to build and own its own network. It would have to find a vendor to build the network and lease it to them. The city would offer its right-of-way to the vendor to ease costs. The issue of public ownership vs. private ownership was thus determined early on out of fiscal necessity: A private company would own the network.

Digital Access and the Community Computer Access Network founder, Catherine Settanni, recognized that the city’s decision to pursue a wireless network was a golden

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<sup>3</sup> Comments attributed to Jim Farstad are taken from his remarks at the Community Benefits Luncheon at the Minneapolis Marriott on October 23, 2006.

opportunity to make headway in bringing technology to the most underserved populations in the city. She had worked in the field of digital access for years. She runs her own web design firm and heads the Community Technology Empowerment Project (CTEP), which places 25 AmeriCorps/VISTA volunteers in community technology centers. Settanni has long sought support for community-driven public computer sites to provide underserved populations with access to technology. As the Minneapolis city network initiative got underway, she made the case to city officials for a broader conception of the city's search for a broadband or wireless network vendor.

From Settanni's perspective, Minneapolis staff initially viewed the pursuit of a broadband or wireless network as essentially a public safety network, not a digital divide initiative. But Mayor Rybak, with his background in technology, was quick to respond with support for Settanni's digital access efforts. Settanni contacted Farstad and Beck, and helped them develop a fuller response to the rationale for the wireless network. She helped them clarify what problems the city wanted to solve with the new network. Together they came up with the following: The goals of the wireless network were to streamline city services, to provide micro-economic development in neighborhoods, to provide a better environment for visitors and the business community, and to meet digital inclusion goals.

In September 2005, Settanni initiated a sixth working group to discuss the potential for the city's network: the Digital Inclusion Coalition. She quickly recognized that the coalition needed funding in order to be most effective. She appealed to the Minneapolis Foundation, where Joanne Walz was instrumental in providing a \$40,000 grant to the committee. She urged Settanni to forge a partnership with the Alliance for Metropolitan Stability, directed by Russ Adams. Walz was particularly interested in the work the Alliance had done crafting Community Benefits Agreements (CBAs) for land use projects in recent years. These were terms of agreement worked out with developers or city agencies to build in benefits to the community that would be generated by a new land use development or other initiative. Perhaps the city vendor contract would lend itself to the CBA model.

Settanni had been heretofore unaware of CBAs and had envisioned something along the lines of a cable franchise model for the vendor contract. That would generate some public Internet access much the way cable TV franchises provide public access channels. But the Alliance staff believed that the Wireless Minneapolis vendor contract was a strong candidate for a community benefits agreement. In a series of twice monthly roundtables and meetings from September 2005 to June 2006, the Digital Inclusion Coalition was able to craft a series of desired community benefits that they felt should be attached to the final vendor contract.

The city issued a request for proposals (RFP) for a vendor to build a wireless network in late 2005. The RFP made it clear that the completed network would be owned by the vendor but would use and build upon the city's existing fiber optic network. When the media got wind of the city's plans, the public vs. private ownership debate became the focal point. Both *The Pulse* and *City Pages* ran stories lambasting the city for selling out by planning to give a lucrative contract to a private vendor rather than setting up a public



ownership structure.<sup>4</sup> Indeed, many community members found this to be a divisive point and the Digital Inclusion Coalition spent a fair amount of time discussing the issue, for local journalists had implicated them as well in the supposed sell-out to big business over the public good.

On Feb. 24, 2006, the city council held a public hearing on the wireless initiative. Some citizens spoke out against the idea of private ownership of the network. But more people came and spoke about the potential community benefits that would be gained through a public-private ownership model. The Digital Inclusion Coalition had already drafted ideas of what it wanted to see in terms of community benefits:

- moderate-cost monthly rates for wireless service for residents;
- reduced monthly rates for wireless service for nonprofit organizations;
- a “walled garden” where all residents could access free web pages relating to their own neighborhood, as well as the city of Minneapolis web site and select other community service web pages; and
- the establishment of a Digital Inclusion Fund that would be created by the vendor and would grow with a small portion of the vendor’s profits over time, and could be used to fund local digital inclusion initiatives.

The City Council members were swayed by the united front so many speakers presented and were pleased to give back to the community even as they moved forward with a private company. At that February meeting they approved a business model that called for a public-private partnership to build and manage the network. In addition, the city council made an important step: They stated that the request for proposals (RFP) would be amended to make community benefits *required*, not just *desired* of the winning vendor.

The coalition members were very pleased with the results of the February 24 meeting. In fact, at this stage many of the coalition members felt their work was done and subsequent meetings of the coalition dwindled to just a handful of attendees. In March 2006 Settanni and city staff set up the next incarnation of the coalition: the Digital Inclusion Task Force. The task force was similar in charge to the earlier coalition, but was formed to reassess the coalition’s proposed community benefits with a broader and more intentionally representative group. The 29 members of the group included representatives from public libraries, schools and parks; nonprofit and community groups; higher education; business and finance; and other service and technology firms.

The task force reopened the discussion of optimal community benefits. They reviewed the results of a community technology needs survey for Minneapolis residents, available in four languages, which the Community Technology Empowerment Project developed and administered at community meetings throughout the city with the help of their

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<sup>4</sup> See Aaron Neumann, “Rybak’s Great Giveaway: The Selling Out of Public Wi-Fi,” *Pulse of the Twin Cities*, February 8, 2006, available online at <http://pulsetc.com/article.php?sid=2303>.

AmeriCorps volunteers. The survey asked people to consider whether the winning network vendor should subsidize or give discounts to individuals and/or businesses and nonprofits, whether and how the vendor should support a digital inclusion fund, how that fund should be managed and disbursed, and what free web content should be provided. The task force used the results of the 458 completed surveys to support and refine the community benefits they had been outlining.

In response to the city's RFP, according to the Wireless Minneapolis informational web site, "more than 90 vendors expressed interest, 20 vendors registered for prime contractor status, and nine vendors submitted proposals. In the summer of 2006, two vendors who were identified as finalists each ran a pilot program in the north and southeast quadrants of Minneapolis so their construction approach and service delivery could be evaluated."<sup>5</sup>

Earthlink built the pilot site in the Near-North neighborhood and US Internet built the pilot site in Cedar Riverside. The pilot sites included mounted signal towers in the select neighborhoods and a community-centered portal page for the network. They informed neighborhood organizations of the planned pilot sites, hosted kickoff events, and loaned laptop computers to residents to access the wireless network. The Digital Inclusion task force stayed in contact with the two candidate vendors during the pilot process, paying for refreshments and other extras to boost community participation in the kickoff events and generally build community awareness of the pilot sites.

In July 2006, the Digital Inclusion Task Force released its community benefits report, which incorporated many of the coalition's recommendations. The task force knew that some Minneapolis residents might prefer to have free wireless service, but that would not result in funds to use for digital divide initiatives. By charging a monthly fee that undercut the competition, the vendor would still turn a profit, and there would be revenues generated to feed into a growing Digital Inclusion Fund to use for community initiatives. The West Bank pilot site web page had been developed using local community organization information and tapped the Twin Cities Daily Planet news source as its banner. This prototype could be incorporated into the future home page of the Wireless Minneapolis web site. Under the community benefits terms, revenues from any ads sold on the community portal page will go into the Digital Inclusion Fund.

The two finalist vendors submitted their final proposals in August 2006, including in them their plans to meet the community benefits terms. In September 2006 the city selected local firm US Internet as the winning vendor. The contract with US Internet, with its raft of community benefits agreement terms, was signed in October 2006.

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<sup>5</sup> Details stated on the Wireless Minneapolis homepage, located at <http://www.ci.minneapolis.mn.us/wirelessminneapolis/nextsteps.asp>

The final community benefits included in the contract are as follows:<sup>6</sup>

- \$500,000.00 up front to a new digital inclusion fund
- 5 percent annually of ongoing pre-tax net income to the same fund
- 2 percent of additional profits from adjacent community contracts to the fund
- Subsidized services to over 100 nonprofit agencies, and vouchers for trial accounts to CTCs to distribute to constituents and volunteers
- A free “walled garden” of content, available to everyone who can access the signal, that includes neighborhood portal pages, city web sites, and public safety information
- 100 percent of portal page advertising revenue will be directed to the digital inclusion fund
- A content management system, and community server, for use by neighborhoods and community groups
- A guarantee of network neutrality

The most substantial portion of the community benefits is the Digital Inclusion Fund that US Internet is establishing. City officials note that “In total, it is expected that about \$11 million will go into the digital inclusion fund over the 10-year term of the contract.”<sup>7</sup>

The Digital Inclusion Task Force will continue to meet until March 2007 in order to select a community foundation to manage the newly created Digital Inclusion Fund. The task force will determine the funding priorities and will select advisory board members to oversee the fund.

### **A model for other cities**

The Minneapolis model is not a common one, and it is certainly not a given that community benefits would come out of the process. The Wireless Minneapolis web site notes that “US Internet is providing a comprehensive set of benefits to the community that go far beyond what any other city in the country has negotiated.”<sup>8</sup> Some of the other city negotiations and attempts to build networks have stalled or become arduous, as in these cases:

- Philadelphia was the first in the country to sign a wireless deal, but they haven’t managed to build it yet. Earthlink received the contract and will own the network. Unfortunately Verizon, Sprint and the other major telecom companies sued over antitrust laws and won an injunction against all other

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<sup>6</sup> Community benefits are quoted from the Digital Access web site at <http://www.digitalaccess.org/>.

<sup>7</sup> <http://www.ci.minneapolis.mn.us/wirelessminneapolis/wirelessfaq.asp>

<sup>8</sup> [http://www.ci.minneapolis.mn.us/wirelessminneapolis/commbenefits\\_wireless.asp](http://www.ci.minneapolis.mn.us/wirelessminneapolis/commbenefits_wireless.asp)

Pennsylvania cities building wireless networks, grinding wireless progress to a halt across the state.

- San Francisco city officials signed a deal with Google and Earthlink to build a wireless network. In the process the city sold the private information of their residents, yet failed to negotiate any digital inclusion benefits from the private vendors. Community groups and the city itself lost its leverage once it signed the contract, so there is little that can be done to remedy the situation in favor of the public at this stage.
- Chaska, MN owns and runs its own wireless service for its 2800 households. The public ownership model works well in Greater Minnesota because it is not cost effective for private vendors to come out and build an extensive network for a small population. While the Chaska service is functioning well for the coordination of city services as well as residential wireless connections, the city in effect became an ISP (an Internet service provider), a time-consuming undertaking adding to the workload of city staff.

How did Minneapolis succeed where other cities fell short? According to Settanni, “It was good old-fashioned community organizing” that made the difference. It mattered greatly that citizens expressed their interest in seeing community benefits early in the city’s process. Settanni was able to articulate the need for digital equity from the start, and she served as a leader with the skills to explain the access issues and to help the coalition and task force get their work done. Having worked with community groups on technology issues before this initiative reduced time getting oriented. Settanni had the mailing lists of interested citizens from day one.

One hurdle she faced was that she couldn’t use all the organizing tools advocates normally tap today, since she couldn’t take for granted email or web access by the digital equity base supporters. She had to rely on phone calls and in-person community meetings, which were more time-consuming than using digital tools, but highly effective for this constituency. Settanni reread the famed community organizer Saul Alinsky’s books for ideas about how to get more people on board and how to make their strongest case for digital equity. Small details from Alinsky like the importance of providing food at community meetings went a long way toward building people’s trust and commitment to the issue.

Settanni’s counterparts in Chicago, now in the early stages of a wireless initiative, are turning to her and the Digital Inclusion Task Force for advice on how to best energize their citizens around digital equity. The stakes are even higher in Chicago, where rates of poverty and racial isolation are much higher and public access to technology lags far behind. Several of the Chicago technology activists attended the Muniwireless.com conference in Minneapolis in late October. They came to a Community Benefits luncheon hosted by the MSNet Fund on Oct. 23, held to celebrate the wins of the Wireless Minneapolis plan and share their process with their Chicago peers. The Chicago lead organizer Michael Maranda made it clear that having Minneapolis get its deal done

first, with its many community benefits and its public-private partnership, makes it a model for their city and an asset to turn to if organizing efforts bog down.

Closer to home, St. Paul is considering a wireless city initiative as well. City officials in the capital city slowed down their process to wait and see what happened with the Minneapolis vendor negotiations. St. Paul could benefit from cost savings between \$10 million and \$20 million by extending the Minneapolis wireless network into St. Paul, and potentially extending the community benefits as well.<sup>9</sup> This would provide a benefit to residents of either city who cross between the two cities for work or errands on a regular basis. The Digital Inclusion Task Force had the foresight to write into the CBA contract language that 2 percent of US Internet's profits from any future deals with adjacent cities would go back into the Digital Inclusion Fund, to be doled out to nonprofit organizations. Twin Cities suburbs may similarly want to extend the service into their cities, building the network and the Digital Inclusion Fund further.

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<sup>9</sup> Cost savings figures noted by Catherine Settanni in interview with IRP staff.

# 6

## RESERVATIONS

Barriers and Opportunities for Minnesota Tribes



*Pillsbury United Communities, Minneapolis*

## 6. RESERVATIONS: Barriers and Opportunities for Minnesota Tribes

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In today's digital age, computer literacy has become a fundamental aspect of modern education – for both children and adults, and in rural and urban areas. However, the development of a successful technology infrastructure is particularly important in rural areas and Indian reservations. Geographically and culturally remote, Indian reservations experience isolation that can only be countered by technological communication. If an Indian reservation is secluded and lacks resources to allow it to effectively compete with schools in other communities — particularly the schools in the metro region — then Internet connectivity is a useful and efficient way to bridge the gap between the rural technological have-nots and the urban technological haves. Understanding that technological resources are not only available but necessary is fundamental to bridging the digital divide on Indian reservations. Without the implementation of more advanced technological programs and curriculums, Indian Country will simply be unable to keep pace with the rest of the state.

In addition to its educational importance, technology access also serves as an essential business resource on reservations. Technology is undeniably fundamental to modern business development, and it is a necessary resource for large businesses and small, tribally-owned ones alike. Many tribal entrepreneurs, for example, earn a living by selling their homemade products on web sites like eBay.<sup>1</sup> Despite the importance of proper technology development, the Minnesota Rural Partners concluded in 2004 that on Minnesota reservations, “tribal technology-based small business development and entrepreneurship strategies are generally underdeveloped.”<sup>2</sup> This assessment means that improvement of technological resources and digital access is crucial for reservation businesses to succeed. If improvements are made, the development of technological infrastructure in Minnesota Indian Country will likely facilitate business transactions, growth, and development.

Connectivity is also fundamentally important on Indian reservations for health care purposes. Not only will the Internet provide tribal members with the opportunity to search for health care information on the web, but it is also essential for the routine maintenance of hospitals and other health care facilities. Healthcare facilities often use the Internet to maintain their medical records, and without connectivity, record-keeping becomes all the more difficult. For example, in its 2004 report, Minnesota Rural Partners described difficulties that the Mille Lacs health care facilities encountered due to technological deficiencies. Indian Health Services in Bemidji uses an electronic medical record system, and then its affiliated sites need to enter their records into this system as well.<sup>3</sup> At the time of Minnesota Rural Partners' report, Lake Lena, one of the other sites, had an inadequate Internet connection, which prevented the facility from directly entering

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<sup>1</sup> Community Technology Advisors Corp., *Telecommunications and Technology Assessment of Rural Indian Reservations in Minnesota*, On behalf of Minnesota Rural Partners, Inc. (December 28, 2004), p. 27.

<sup>2</sup> Ibid, p. 6.

<sup>3</sup> Ibid, pp. 15 and 41.

its records into the electronic records system.<sup>4</sup> Instead, the Lake Lena facility had to manually enter its medical records.<sup>5</sup> Without sufficient Internet connectivity, Indian health care facilities may be unable to maintain systems that other facilities take for granted.

### **Problems implementing technology on Minnesota reservations**

Minnesota Indian reservations face a number of problems which account for their stark inaccessibility to technology resources. Chief among the problems are inconsistencies, maintenance issues, inadequate home access, and recent deregulatory decisions about the Internet.

#### *Inconsistencies*

The technological problems among the Minnesota tribes and reservations are varied and inconsistent. While one reservation might widely offer DSL, other reservations might only offer a dial-up connection. As a result of the variation among different reservations, there is not one fixed solution to improve access on all Minnesota reservations.

Even within a reservation, access varies dramatically. The settlement of Indians and non-Indians has led to “checkerboard ownership pattern[s] of Indian and non-Indian owned land,” which makes controlling access all the more difficult.<sup>6</sup> Additionally, each reservation contains significant geographical variations – terrain which makes it more difficult to provide access. Hills and trees make the rural reservations a topographical nightmare for providing Internet access to most tribal and community members, and particularly the more remote members<sup>7</sup>. Moreover, the large size of some rural reservations prevents the tribes from connecting all of its offices and community resources to the Internet. For example, at 36 square miles, the White Earth reservation cannot connect all of its tribal offices and community centers with one broadband Internet connection.<sup>8</sup> This creates connectivity problems for many members and employees: While some can access the White Earth server, members located in the outlying areas of the reservation cannot access the server at all.<sup>9</sup> The low population density and distance from population centers greatly affects the ability of tribal members in remote areas to connect to the Internet.<sup>10</sup>

Contributing to this problem is the multitude of telecommunications providers within each reservation. Several of the Minnesota tribes have multiple incumbent providers throughout their reservations, which add complexity and inconsistencies in access and quality.<sup>11</sup>

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<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>6</sup> Ibid, p. 24.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Ibid, p. 5.

<sup>11</sup> Ibid.



The problem of variation and inconsistency is not only a geographical problem, but a human problem as well. According to the Minnesota Rural Partners' 2004 assessment, reservation members provide a wide array of technological knowledge: some tribe members have an open, knowledgeable attitude toward technology, while others at the opposite end of the spectrum hold no knowledge or desire to use computers. Basic knowledge about computers and the Internet simply cannot be taken for granted on the Minnesota Indian reservations. Indian reservations provide few resources, if any, to adults, instead concentrating what little resources they have in their schools. To highlight this problem, the Minnesota Rural Partners found in its 2004 study that "there are few, if any, intensive efforts outside of the K-12 education systems to ensure that tribal members have the necessary skills to benefit from technology opportunities."<sup>12</sup>

#### *Inability to maintain technology resources*

Another major problem on the reservations is that the technological improvements are difficult to maintain. While tribal members have found little difficulty in obtaining the initial grant funding to support their technology efforts, the reservations often struggle with the long-term maintenance of projects.<sup>13</sup> As long as the projects are not maintained, it is unlikely that the reservations will obtain any long-term technological advantages from them. Additionally, tribes often struggle with the grant-writing process.<sup>14</sup> Technology managers and grant writers may underestimate maintenance problems, in which the grant writers do not sufficiently convey the depth of technological problems and the need for funding.<sup>15</sup> Maintenance issues need to be addressed if the tribes wish to keep their programs maintained and fully operational.

#### *Inadequate home access*

It is also important to note that the need for technology access on reservations is not limited to schools or community centers. In order to compete in our digital age, students must have quality at-home Internet access so students of all ages can access school material and information from home. Having full access means being able to use technology in the evening and on weekends, when community labs or schools may not be open. Current technology access in reservation homes represents a stark contrast to technology access in wealthier, metropolitan areas where residents are less time-constrained in their access to the Internet. Without more universal access, students living on Indian reservations will simply be unable to keep up with their urban and suburban counterparts.

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<sup>12</sup> Ibid, p. 6.

<sup>13</sup> Ibid, p. 13.

<sup>14</sup> Ibid, p. 34.

<sup>15</sup> Ibid.

## Recent Deregulatory Decisions: Brand X

The Federal Communications Commission (FCC) has played a crucial role in regulating and ensuring Internet connectivity rights, but in June 2005, that role was greatly diminished by the Supreme Court's decision in *Nat'l Cable & Telecom. Ass'n v. Brand X Internet Services*, 125 S. Ct. 2688 (2005). Prior to the decision, the Federal Telecommunications Act of 1996 provided for FCC regulations of common carriers like telephones, radios, and the Internet. However, in the 2005 *Brand X* decision, the Supreme Court held that cable modem Internet services can no longer be regulated by the FCC. In coming to this conclusion, the Court focused on the differences in the statutory definitions of "information services" and "telecommunications services," which are defined in the Telecommunications Act. Under the Act, "information service" providers are *not* subject to FCC regulation, while "telecommunications service" providers *are* subject to FCC regulation. The central question in the case is whether cable modem services should be categorized as *information* services or *telecommunications* services. The Court determined in *Brand X* that broadband cable service provides "information services," and as a result, broadband companies cannot be regulated by the FCC. The Court reasoned that broadband cable modems should be classified as information services because they manipulate and store information. Broadband cable providers do not offer telecommunications services; they merely use telecommunications to provide users with information services.

Moreover, the decision indicates that in the near future, the FCC will no longer be allowed to regulate DSL connections as well. Because regulatory power would ensure that the Internet was distributed equitably, its deregulation could have negative consequences for equity concerns.

## Programs to bridge the digital divide on Indian reservations

While there are a number of technological barriers facing Indian reservations, there are also solutions and programs which the tribes can use to improve technology access. The following section outlines solutions and programs which can be used to combat the digital divide.

### *Tribal colleges & recognition of Indian culture*

By and large, colleges serving tribal members have successfully upgraded their offerings to provide the latest technology to their students.<sup>16</sup> By offering resources to both students and community members alike, tribal colleges improve technology access not only for students, but the entire Indian reservation as well.<sup>17</sup> This is particularly important because the Minnesota reservations have made little, if any, efforts to introduce technology to the non-student population.<sup>18</sup> Moreover, tribal colleges are particularly helpful because they

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<sup>16</sup> Therese Bissell, *The Digital Divide Dilemma: Preserving Native American Culture While Increasing Access to Information Technology on Reservations*, 2004 U. Ill. J.L. Tech. & Pol'y 129, 144.

<sup>17</sup> *Ibid.*

<sup>18</sup> Community Technology Advisors Corp., p. 6.

provide technological education while also incorporating important aspects of tribal culture.<sup>19</sup> Researchers underscored the importance of culture recognition when promoting technological knowledge on Indian reservations.<sup>20</sup> Additionally, most of the tribal colleges throughout the United States are located on reservations in “extremely remote, poor areas,” and as a result, tribal colleges are among the few institutions in the position to offer technology to populations which are often overlooked.<sup>21</sup>

Furthermore, the content of the web sites must be culturally specific, so that each individual Internet user can relate to the message of each site. Different tribes have different technology needs, and this needs to be taken into account when structuring the accessible technology. Many Indians have expressed a lack of interest in joining the computer revolution and prefer to uphold private, isolated, and nature-connected activities.<sup>22</sup> As a result of this inherent defensiveness to new technologies, it is of the utmost importance that reservations promote sites that are as accessible and meaningful as possible for those who want computer access and skills, and programs which encourage Indian-specific culture.

### *FCC programs*

Despite the recent *Brand X* decision which limits the FCC’s ability to regulate some Internet connections, the FCC is still committed to improving telecommunications access on Indian reservations. The FCC oversees and administers programs to promote and improve telecommunications connectivity in Indian Country. The FCC has three major programs that benefit Indian Country, including the Minnesota reservations.

#### Indian Telecommunications Initiatives (ITI)

The ITI program serves as a largely educational forum for consumers on tribal lands nationwide to learn about federal programs which provide discounts for telecommunications services. With annual regional workshops and roundtables in Indian Country, the ITI program provides “how to” information on telecommunications services and infrastructure development. In addition to the annual conferences, the ITI holds one-on-one meetings between tribal representatives and FCC staff. The ITI program also distributes educational materials through tribes and tribal organizations. Importantly, the ITI program recognizes tribal differences, differences which normally serve as a large impediment to meeting technology goals. In line with this recognition, the FCC accepts that different tribes are at different levels of technological sophistication, and it correspondingly designs its interactions with tribal members to reflect these differences.

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<sup>19</sup> Therese Bissell, *The Digital Divide Dilemma: Preserving Native American Culture While Increasing Access to Information Technology on Reservations*, 2004 U. Ill. J.L. Tech. & Pol’y 129, p. 145.

<sup>20</sup> Ibid, p. 146.

<sup>21</sup> Ibid, p. 145.

<sup>22</sup> *Saving the people’s right to know: Fight Internet strangulation*, *Indian Country Today* ¶ 3 (June 16, 2006). URL: <http://www.indiancountry.com/content.cfm?id=1096413150>.

## Universal Service Fund Programs

This FCC-sponsored program offers financial incentives to institutions that provide telecommunications and information services, making services more affordable for consumers who might otherwise be unable to afford them. Tribes, Indian businesses, and tribal consumers are eligible to receive Universal Service assistance. Most notably, the School and Libraries Program, a subsidiary of the Universal Service Fund Program, provides support to schools and libraries to purchase telecommunications and information services. The Rural Health Care Program is also helpful, aiding health care providers to buy telecommunications services. The telecommunications companies receive the aid directly from the FCC, and then the companies pass on the aid to the tribal customers in the form of reduced prices.

While this program is helpful, it is highly contentious in Indian Country. In order to receive Universal Service funds, a carrier must be designated as an “Eligible Telecommunications Carrier,” or “ETC.” State governments, not federal governments, make this ETC designation. However, because of tribal sovereignty rulings through United States history, the tribal communities are only sometimes subjected to state laws and rulings. Because the states designate the ETCs, the tribal communities are inadvertently subjected to state law, which the tribes feel encroaches upon their sovereignty. Even more contentious is the fact that the tribes are not always notified when an ETC designation is made.<sup>23</sup> If a tribe is notified, it has the opportunity to challenge the designation if the tribe opposes the designation. But because the tribes were not always notified of the designations, tribes were forced to live with the state’s designations without being provided any remedies to challenge the designation. Because of these problems, the FCC has become more sensitive to tribal communities in recent years by establishing procedures to ensure that the tribes receive proper notification of ETC designations. The FCC has become more sensitive to tribal communities in recent years by communicating with them as they do with states.

Because of inherent jurisdictional issues between tribes, states, and the federal government, the dispute between state and tribal interests over ETC designations will likely remain a contentious issue. Regardless of its controversial nature, the Universal Service funds do provide reservations, including those in Minnesota, with financial support for telecommunications services.

## Tribal Lands Bidding Credits (TLBC)

In order to promote increased telecommunications access on reservations, the FCC created a bidding credit program which provides bidding incentives to

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<sup>23</sup> 56 Admin. L. Rev. 263, 298.

wireless carriers that create telecommunications infrastructure in tribal areas. While this federal program encourages telecommunications companies to develop services in tribal areas, it usually only helps “outside” companies, i.e., companies not owned by the tribes.<sup>24</sup> In order to promote tribal entrepreneurialism, it would be helpful to provide tribally-owned companies with extra incentives.

Although the FCC has tried to improve its relationship with Indian tribes, many argue that it, and the federal government as a whole, must do more to fully recognize Indian sovereignty and telecommunication inequities. Because of the federal government’s trust relationship with Indian tribes, commentators argue that the federal government has a fiduciary responsibility to improve tribal access to telecommunications.

### *Other government-initiated programs*

While the FCC outlines the most intensive efforts to improve technology access on Indian reservations, the federal government offers other forms of aid to tribes as well. The following programs represent some of the major grants and programs available to tribes, though the list is not exhaustive:

#### Community Connect Program

The Community Connect Program promotes broadband service in extremely rural, lower-income communities where it currently does not exist. Additionally, the program seeks to promote community-oriented connectivity that would stimulate economic development and enhance educational opportunities. This is particularly important on the Minnesota Indian reservations, where improvements to educational and business technology are imperative to keep pace with the rest of the state. Although these grants may be given to non-tribal groups, the program is still intended to help tribes.

#### Rural Business Enterprise Grants (RBEG)

The RBEGs are meant to create, expand, or operate rural distance learning networks or programs that provide educational or job training instruction. Indian tribes on Federal and State reservations which serve rural areas are eligible for this aid. Because tribal businesses could greatly benefit from this additional aid, it is important that Minnesota tribes apply for these grants.

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<sup>24</sup> Bissell, p. 148.

## Distance Learning and Telemedicine Loans and Grants

Any organizations that use telecommunications or technologies to provide educational benefits are eligible for these federal grants, such as organizations like schools or libraries. These grants are offered by the US Department of Agriculture's Rural Development Program. Grant money can be used for computer equipment like hardware, software, networking components, audio and video systems, and interactive video. Additionally, the funds can be used for providing technical assistances and instruction for any eligible equipment. Reservation schools, libraries, and health care facilities could benefit greatly from these grants.

### *Tribal Initiatives*

Much of the literature about the digital divide in Indian country focuses on the establishment of tribally-owned telecommunications companies to improve tribal access to the Internet. If the tribes created their own telecommunications companies, the tribes, instead of companies like Qwest, Paul Bunyan, or Sprint, would provide telecommunications support on the Indian reservations. This is a viable option if tribes cannot obtain desirable levels of services from the incumbent provider, if they desire sovereignty, or if they wish to create a new revenue source.

In the most common scenarios, if a tribe is unhappy with its current telecommunications provider, it has two options: (1) It can petition the state public utilities commission to revoke the provider's certificate of authority to serve in Indian Lands, or (2) it can place a new telecommunications structure alongside the incumbent and compete with the incumbent. Because the former option usually precipitates a legal dispute, many tribes choose the latter option and create their own tribal telecommunications provider.

Because of jurisdictional issues of sovereignty, Indian-owned telecommunications companies will largely work with the federal government — and not state governments — to abide by laws. If an Indian-owned telecommunications company wants to provide services like 411, 911, or an operator, then the tribal company would need to collaborate with state agencies. Beyond those services, an Indian-owned company would not need to work with the state government at all, because the state has little jurisdiction over the tribes in telecommunications issues.

If a tribe decides to start its own telecommunications company, it can establish either a broadband company or a telephone company which provides DSL and dial-up connections. There are advantages and disadvantages to each choice. Broadband enterprises are considerably easier to enter than phone businesses because phone company start-ups can be complex and expensive. For example, to become a valid telephone company, an organization must file extensive Competitive Local Exchange Carrier (CLEC) paperwork, which requires significant technical expertise. Several tribes have done this and have launched their own telephone companies, though the process is complex.

However, there are benefits to choosing a telephone company over a broadband company. For example, tribes may want to start a telephone-based telecommunications company, instead of broadband, because offering telephone services can open the door to federal financing resources and ongoing support through the U.S. Department of Agriculture's Rural Utility Services and Universal Service Funds. Wireless service can also qualify for this funding.

Furthermore, it is beneficial for tribes to own their own telecommunications companies because they avoid hurdles of rights-of-way issues. If a non-tribally-owned company wishes to use reservation land for its infrastructure, it must pay the tribe to do so. Sometimes this results in legal disputes. But if the tribe owns its own company, it would not need to deal with the complex right-of-way battles as outside companies must do.

### *Wireless Service*

Because many Indian reservations are geographically remote and topographically diverse, telecommunications companies are reluctant to develop wired networks in the difficult terrains. Wired infrastructures are expensive and impractical in rural areas. As a result, one solution to the connectivity problem in Indian Country is to develop wireless services instead of their wired counterparts, which eliminate the barriers imposed by a wired connection. Wireless services do require some level of infrastructure, such as wiring for every mile or so.

### **Conclusion**

The Internet provides a large and unprecedented way to bridge geographical, social, and economic barriers between the haves and have-nots, and Native Americans in Minnesota finding ways to harness these promising new opportunities. Although the current status of technology on Minnesota Indian reservations is lagging behind the nation — largely due to inconsistent services, inadequate home access, and the recent deregulation of Internet services — there is much progress that can be made. The Federal Communications Commission is committed to improving connectivity in Indian Country and has devoted significant resources in the form of workshops and grants. Additionally, the Minnesota Indian reservations can create their own Internet companies. Although such an enterprise requires upfront resources, the investment provides reservations with revenue and jobs, as well as Internet service unfettered by outside companies.

# 7

## REPORT FINDINGS

Achieving Digital Justice



*Corcoran Park Community Center, Minneapolis*



## 7. REPORT FINDINGS: Achieving Digital Justice

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The preceding sections of the Digital Justice report outline ways that public labs, schools, libraries, cities, and reservations are addressing the digital divide nationally as well as in Minnesota. The report finds the following points to be the most promising areas for bringing technology to a wider swath in Minnesota.

### **Cities can be catalysts in digital inclusion efforts**

The city of Minneapolis struck a favorable deal with US Internet, a wireless network vendor, in which the city is sharing its existing fiber-optic infrastructure with the vendor in exchange for a series of community benefits built into the contract. Other cities in Minnesota, particularly those contiguous with Minneapolis, would be wise to review the process Minneapolis took to reach its vendor agreement. Minneapolis residents benefit in numerous ways from the arrangement. In addition to the low cost of \$20 per month for wireless Internet, Minneapolis residents will benefit in the following ways:

- The vendor is contributing to a Digital Inclusion Fund that will support efforts to bridge the digital divide in Minneapolis;
- 100+ nonprofits will receive subsidized Internet service; and
- Anyone who can access the wireless signal will be able to access free community information on the portal web pages.

When cities do not negotiate community benefits with the vendor, none of these benefits happen; they are simply not part of the traditional deal. Cities must be proactive in negotiating community benefits from their vendor. Other Minnesota cities like St. Paul, St. Louis Park, Apple Valley, Burnsville, Farmington, Lakeville and Rosemount are in the process of securing vendors to build wireless networks within their borders.<sup>1</sup> A wireless signal at a reasonable monthly price is not the only goal for a wireless network vendor contract; a savvy mayor, city council and planning staff can work with the community to achieve the same kinds of community benefits Minneapolis did.

When other cities in the region seek vendors on a piecemeal basis, they are unlikely to generate the level of community benefits that Minneapolis achieved unless they approach the bidding process as a chance to negotiate community benefits. If adjacent suburbs join together in search of a wireless network vendor, they have the opportunity to use their leverage to negotiate community benefits, since they represent a larger market for the vendor than a single suburb would. Apple Valley, Burnsville, Farmington, Lakeville and Rosemount are working as a group to negotiate Frontier Communications for wireless service, but there is no indication that they are seeking community benefits, judging from this statement in the *Star Tribune*: “While Minneapolis made a time-consuming project of

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<sup>1</sup> Details on municipal wireless networks across the U.S. and internationally are available at [www.muniwireless.com](http://www.muniwireless.com).

taking bids for a company to build a citywide wireless network, five south-metro communities won't have to bother.”<sup>2</sup>

US Internet, the wireless network vendor working with Minneapolis, has already agreed to provide significant community benefits in the Minneapolis contract and is likely to be amenable to providing similar community benefits in future vendor contracts with other municipalities. Similarly, other wireless network vendors can be held to the same standard now that their competitor has set a precedent of providing community benefits.

### **Reinforcing the connection between public labs and job readiness**

According to the surveys of community technology centers (CTCs) conducted by IRP, urban public computer labs that are not housed in libraries are particularly successful at connecting their users with job skills and real results (interviews and job offers). Other CTCs should look to them as a model for combining technology access with job training resources. CTC users are eager to use the public labs to research job leads, prepare resumes and gain computer skills for job success, according to the results of the CTC user survey. Libraries that survey their patrons are likely to find that people would appreciate expanded job resources, and libraries can be transformed into relevant career-resource hubs.

### **As informational hubs, libraries are natural technology access points**

Brookdale Library in Brooklyn Center is an example of how community input can reshape a library to meet the needs of today's patrons. As more libraries in Minnesota receive physical makeovers, it is critical that library leaders find ways to integrate technology into the facility's approach to information delivery. Patrons expect, demand and deserve high-tech library facilities where they can do far more than check out a book. Libraries can be the lifeline to immigrants' family members in other countries, a safe environment to become more conversational in English, the place where dislocated workers submit online applications for promising jobs, and a place where young people can become “digital natives” who will thrive in tomorrow's economy.

### **School districts can learn from one another on technology integration**

Integration of technology in the classroom varies widely across the state's communities and is affected by student poverty rates, budget constraints and school district will. Successful integration relies on the willingness of teachers and administrators to embrace change, devote precious resources to tech tools and staff development, and make smart and lasting choices among competing digital innovations. Minnesota educators can initiate cross-district conversations to analyze the most effective technology tools in peer districts. School districts across the state are encouraged to review peer district technology plans when developing their new technology plans, as all public school districts must do, for 2008-2011.

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<sup>2</sup> Steve Alexander, “Suburbs may find Wi-Fi close to home.” Star Tribune, October 31, 2006. URL: <http://www.startribune.com/154/v-print/story/779746.html>.

Beyond Minnesota, educators are developing creative ways to integrate technology into the classroom all the time. Teachers and principals should be attentive to new technologies that can save their schools money and labor and help their students learn more effectively. While the key to technology integration may seem to boil down to the expensive prospect of one-to-one computing (one laptop per student), many districts have found creative ways to bring students closer to technology. Teaching students to fix computers can save schools money while teaching students important skills. Classroom web sites keep students and parents informed by putting assignments, grades and problem-solving assistance online. Digital whiteboards make lessons available to students whenever they need it. Rather than an expensive add-on, technology can become an integral part of the curriculum if approached with leadership and foresight.

### **Digital access results in economic development for Indian reservations**

There are many federal funding programs available to Indian reservations to improve access to technology on their lands. Minnesota Indian reservations can also create their own Internet companies. Although such an enterprise requires significant resources, it will provide the reservation with revenue and jobs in addition to access to the web. Internet access is critical to small business development on the reservations. Indian-owned small businesses from retail to information services can use the Internet to market, sustain and build their business. To foster economic sustainability, tribal leaders can work to bring Internet access to their lands, work with tribal colleges to develop and maintain strong technology training programs, and encourage tribal members to develop new web site content that will make the Internet more relevant to currently non-connected Native Americans.

### **Conclusion**

In sum, there are myriad digital justice initiatives in progress that provide complementary approaches to the digital divide in Minnesota and beyond. Technology brings people tools with which to explore their world and the ability to conduct their lives with efficiency in communications and access to information. When portions of a society are unable to access tools that other strata use constantly, the gap widens, resulting in long-lasting divisions in opportunity and outcomes. This report highlights many instances in which institutions are striving to bridge those gaps and bring opportunity to more people. They deserve the funding and necessary resources to fulfill their missions. Schools, libraries and community technology centers are perennially underfunded, yet they provide the underpinnings of fair access to technology for all citizens. Cities have the potential to bring affordable wireless service to their residents and funds to support digital inclusion efforts within their borders. Reservations can improve Internet access on their lands for the sake of economic sustainability. All Minnesota organizations noted in this report are commended for their efforts to bring about digital justice.